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*and*  
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INDEX

	Pages		Pages
January .....	1-118	July .....	697-814
February .....	119-242	August .....	815-924
March .....	243-350	September .....	925-1054
April .....	351-468	October .....	1055-1178
May .....	469-580	November .....	1179-1274
June .....	581-696	December .....	1275-1390

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# American Journal of Public Health

## and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume XX

January, 1930

Number 1

### CONTENTS

	PAGE
A Study of Cultures of <i>Monilia</i> Isolated from Sputum . . . . . <i>Ruth Gilbert, M.D., and William M. Groesbeck</i>	1
Standards for Public Bathing Beaches and Wading Pools . . . . . <i>Report of the Committee</i>	7
Need for Cancer Morbidity Statistics . . . . . <i>Francis Carter Wood, M.D.</i>	11
Discussion.— <i>Frederick L. Hoffman, LL.D.</i> . . . . .	19
The Duties of the Nursing Staff in a Health Department Communicable Disease Service . . . . . <i>Agnes J. Martin, R.N.</i>	21
The Administrative Significance of Proposed Changes in Standard Methods of Water Analysis . . . . . <i>John F. Norton, Ph.D.</i>	27
Annual Health Department Reports . . . . . <i>Report of the Sub-Committee</i>	34
Seasonal and Age Studies of Poliomyelitis and What They Suggest . . . . <i>W. Lloyd Aycock</i>	41
Standardization of the Wassermann Test . . . . . <i>Abstract of Progress Report</i>	47

### EDITORIAL SECTION

Ventilation and Comfort . . . . .	49	The Doctor's Income and Pre- ventive Medicine . . . . .	51
A New Use for the Malarial Parasite . . . . .	51		

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Readers' Guide in your library.

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March 3, 1879.

Continued on page vi

# Rip Van Winkles

*REMEMBER* Washington Irving's lovable, irresponsible Rip Van Winkle? How persistently he tricked himself! Time and again when temptation was too strong and nature too weak, he would lift his glass and say, "I won't count this one".

**T**HERE are many Rip Van Winkles in the world right now—some are weak in self-control; some are sadly behind the times in a matter of vital importance to them. They are the unfortunates among the million diabetics in the United States today.

Old Rip's giant spree put him to sleep for twenty years—but "food sprees" are bringing death to present-day Rip Van Winkles because they lack self-control or lack knowledge as to what insulin can do for them.

Thanks to insulin, a diabetic is not confined nowadays to a scanty, spirit-breaking diet. He can have varied and much more appetizing food than was allowed in the old days. But even now, if he fails to find out what he should eat and drink—or if he fails to be steadfast in obeying orders—he practically commits suicide.

When diabetes attacks, it has come to stay. It rarely gives up. A diabetic has one of two choices, either to put up a cheerful, continuous fight or weakly surrender. Half-way defense spells defeat. But a courageous, unyielding fight is almost sure to win.

One great danger is that with the aid of insulin and correct diet, the diabetic feels so much better that he is lulled into a false sense of security. He takes liberties with his diet or neglects to take the insulin as directed. Then, with crushing swiftness, diabetes may claim another victim.



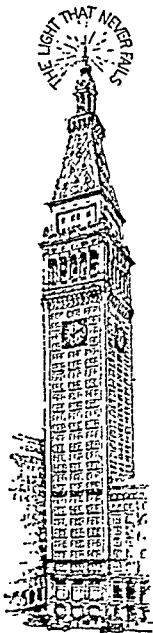
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Thousands of diabetics are not even aware of the fact that they are in danger because they have not had a physical examination which would have revealed the presence of this old enemy of mankind and because, also, during most of its course, diabetes is painless.

Of the 20,000 deaths caused by diabetes last year in the United States, 8,000 were of the acute type ending in coma. Yet a world-famous specialist says, "Diabetic coma is always preventable and nearly always curable... Many of my patients have actually lived longer than would have been expected of them had they been normal, healthy people".

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	PAGE
Victor Clarence Vaughan . . . . .	53
Letters to the Editor . . . . .	56

ASSOCIATION NEWS

1929 Annual Meeting Proceedings . . . . .	61
New Members . . . . .	68
International Hygiene Exhibition . . . . .	69
Public Health Administration— <i>Henry F. Vaughan, D.P.H.</i> . . . . .	70
Full-time Health Protection. Full-time Health Protection in Kansas. County-Wide Health Survey. Tuberculosis Program for Children.	
Laboratory— <i>C. C. Young, D.P.H.</i> . . . . .	72
A Rapid Method of Pipetting Broth in Measured Amounts— <i>G. D. Cummings.</i>	
The Cause of Mustiness in Eggs— <i>M. P. Spanswick.</i>	
Minutes of the Meeting of the Committee on Standard Methods of the Laboratory Section— <i>John F. Norton, Secretary.</i>	
Vital Statistics— <i>Louis I. Dublin, Ph.D.</i> . . . . .	76
Maternal Mortality in the United States. Scarlet Fever. Results of Treatment of Diabetic Children. Puerperal Septicemia in Massachusetts, 1928. Public Health in Kenya. Official Vital Statistics of Scotland.	
Public Health Engineering— <i>Arthur P. Miller, C.E.</i> . . . . .	80
Illinois Mobile Water and Sewage Laboratory— <i>Anselmo F. Dappert and Harry F. Ferguson.</i>	
Changes in Composition of Gas during Digestion of Fresh Solids. Providing Sewer Facilities in Rural Communities.	
Industrial Hygiene— <i>Emery R. Hayhurst, M.D., and Leonard Greenburg, Ph.D.</i> . . . . .	85
Report on 1,000 Physical Examinations of Male Clerical Workers. History of Workmen's Compensation Laws Covering Occupational Diseases. Tentative List of State Regulations, Orders, Advisory Pamphlets, and Labor Laws Relating to Safety in Industry. The Health of Workers in Dusty Trades. Industrial Dental Service. Industrial Disease Investigation Bureau. Some Physiologic Reactions to Cooling Power during Work—With Special Reference to Evaporation of Water. Effect of Carrying Loads. The Problem of Displaced Workers. Status of Industrial Safety Regulations. How Chemistry has changed Industry, and as a Result has changed the Tendency to Occupational Disease.	
Food, Drugs and Nutrition— <i>Walter S. Frisbie</i> . . . . .	90
Nutritive Value of Proteins in Certain Kinds of Sausage and Other Meat Food Products. The Pellagra-Preventive Action of Canned Salmon. Do Baking Powder Residues Exert Injurious Effects upon Growth and Nutrition? Vitamin A Content of the Green and White Leaves of Market Head Lettuce.	
Public Health Nursing— <i>Eva F. MacDougall, R.N.</i> . . . . .	93
Qualifications for Industrial Nurses. The Passing of Anna McGee—a Pioneer Public Health Nurse. She is a Teacher-Nurse.	
Education and Publicity— <i>Evart G. Routzahn</i> . . . . .	95
The Strange Case of Mr. Smith. Will You Help East Orange? January 22, 1930. Recognition of Good Work Done. What Might Have Happened! Make Friends with your Public. Who is Right?—Who Says So? Who Uses Them? The Alabama Movable School. Diphtheria. Reading References. Words "Humanized." Slogans and Phrases. Honorable Mention. Radio. Dates Ahead. Words.	

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Contents—Continued

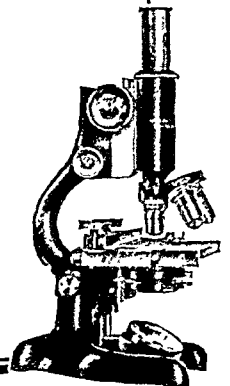
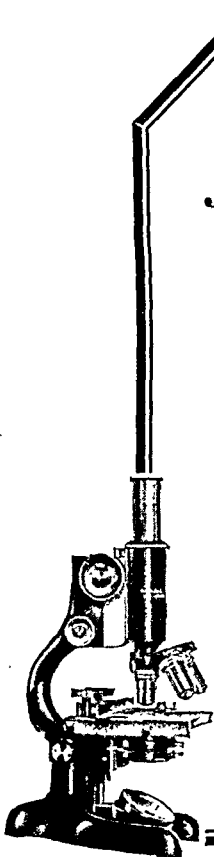
Books and Reports . . . . .	PAGE 99
Laboratory Methods of the United States Army. The Chemical Aspects of Immunity. The Road to Health. A System of Bacteriology in Relation to Medicine. Some Methods for the Prevention of Tuberculosis. Laws Concerning Birth Control in the United States. Meat Through the Microscope. Behavior of the Young Child. Rickets Including Osteomalacia and Tetany. Federal Limitations upon Municipal Ordinance Making Power. Water Supply Engineering. The Doctor in Court. Biological Stains—A Handbook on the Nature and Uses of the Dyes Employed in the Biological Laboratory. A Manual of External Parasites. The Bureau of Prohibition. Report of the Second Laboratory Conference on the Serodiagnosis of Syphilis. Eat and be Happy.	
Health Department and Other Reports—Ira V. Hiscock . . . . .	108
White Plains, N. Y. Attleboro, Mass. San Joaquin, Calif., District. National Federation of Day Nurseries. Jamaica. Seeing Through Life. Willesden, England. England and Wales. Illinois.	
Books Received . . . . .	111
A Selected Public Health Bibliography—Raymond S. Patterson, Ph.D. . .	112
News from the Field . . . . .	115
Conferences . . . . .	117

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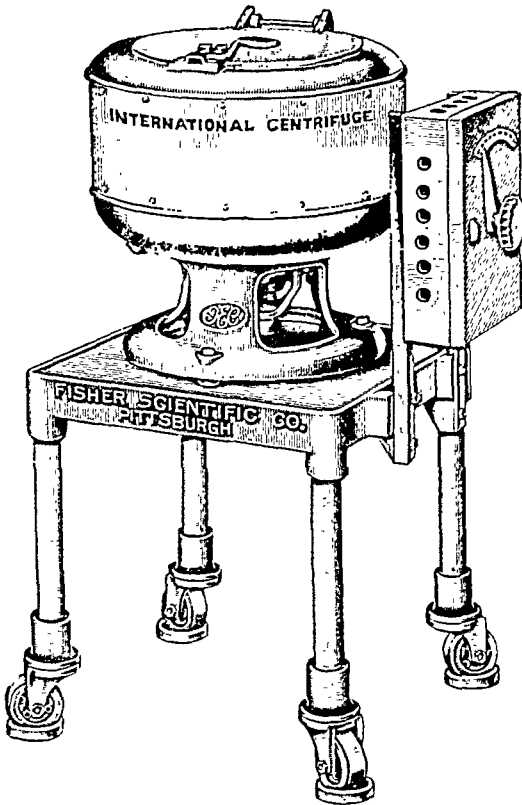
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Volume XX

February, 1930

Number 2

### CONTENTS

	PAGE
The Influenza Epidemic of 1928-1929 with Comparative Data for 1918-1919 . . . . .	119
<i>Selwyn D. Collins, Ph.D.</i>	
What We Know of Influenza and How We May Add to Our Knowledge . . . . .	130
<i>Edwin O. Jordan, Ph.D.</i>	
Typhoid Fever Epidemic Occurring During the Summer of 1928 . . . . .	137
<i>William C. Hassler, M.D.</i>	
First Aid Cabinet of a School Nurse, Her Standing Orders for First Aid, and Her School Nursing Procedure . . . . .	147
<i>Charles Christopher Wilson, M.D.</i>	
Anthrax as an Occupational Disease . . . . .	155
<i>Report of the Committee</i>	
Some Difficulties in the Collection of Records . . . . .	161
<i>Stewart G. Thompson, D.P.H.</i>	
Responsibility of the Public Health Nurse for Social Phases of Her Work . . . . .	165
<i>Katherine Faville, R.N.</i>	
How To Tell What . . . . .	171
<i>Iago Galdston, M.D.</i>	
Pasteurized Dried Fruits . . . . .	175
<i>Carl R. Fellers, Ph.D.</i>	

### EDITORIAL SECTION

The Use of Irradiated Foods . . . . .	182	X-Rays and the Public Health . . . . .	185
Should Certified Milk Be Pasteurized? . . . . .	183	Increase in Malaria . . . . .	185

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Readers' Guide in your library.

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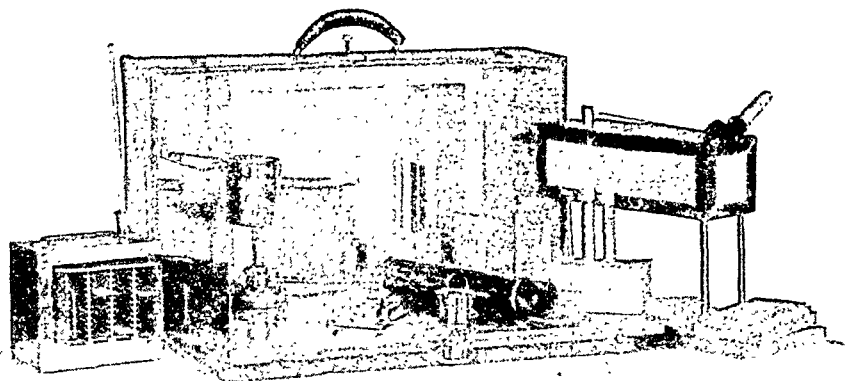
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Continued on page vi



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	PAGE
Dr. Frederick Montizambert . . . . .	187
Letters to the Editor . . . . .	188

## ASSOCIATION NEWS

Standing Committees of the Association . . . . .	191
Meeting of the Association in Salt Lake City . . . . .	192
A. P. H. A. Badges . . . . .	193
Public Health Administration— <i>Henry F. Vaughan, D.P.H.</i> . . . .	194
Conquering Diphtheria. Diphtheria Prevention in Yonkers. Influenza Incidence.	
Laboratory— <i>C. C. Young, D.P.H.</i> . . . . .	195
Convenient Platinum Needle— <i>C. S. Mudge</i>	
The Communion of Blood Clots for Cultures— <i>T. F. Sellers and Janie F. Morris</i>	
Vital Statistics— <i>Louis I. Dublin, Ph.D.</i> . . . . .	196
Health in Iceland. The League Steps Out for Greece. Sickness in Essex County.	
A Smallpox Outbreak in Massachusetts. Diabetes Record for 1928. Vital Statistics for Northern Ireland.	
Public Health Engineering— <i>Arthur P. Miller, C.E.</i> . . . . .	201
Stream Pollution Control in Illinois— <i>H. F. Ferguson</i>	
Stream Pollution Program in Virginia— <i>A. Wagner</i>	
Stream Pollution in West Virginia— <i>L. Kermit Herndon</i>	
Solving Oil Field Waste Disposal Problems. Movement of Water in Alluvium.	
Industrial Hygiene— <i>Emery R. Hayhurst, M.D., and Leonard Greenburg, Ph.D.</i> . . . . .	207
The Evaluation of 5 and 7 Per Cent Carbon Dioxide Mixtures as Respiratory Stimulants. The Use of 7 Per Cent Carbon Dioxide and 93 Per Cent Oxygen in the Treatment of Carbon Monoxide Poisoning. Some Physiologic Reactions to Cooling Power during Work, with Special Reference to Evaporation of Water. Physical Examination of Athletes. United Fruit Company, Medical Department, 17th Annual Report. Sickness among Industrial Employees during the First Three Months of 1929. Efficiencies of Painters' Respirators Filtering Lead Paint, Benzol and Vitreous Enamel Sprays. Regulations for Spray-Coating. Industry Reports, Published to Assist Underwriters in Classifying Industrial Hazards. Health Hazards in Industry. The Pathology of Silicosis of the Lung. Some Aspects of Silicosis in Industry.	
Food, Drugs and Nutrition— <i>Walter S. Frisbie</i> . . . . .	212
The Nature of the Vitamin A Constituent of Green Leaves. A Second Thermolabile Water-Soluble Accessory Factor Necessary for the Nutrition of the Rat. Some Evidence of the Existence of a Further Factor Necessary for the Growth of the Rat. The Number and Type of Bacteria in Commercially Prepared Infant Foods. Botulism Due to Home Canned Bartlett Pears. Is Irradiated Farina as Bought in the Market Enriched with Vitamin D? Whole-Meal Bread.	
Public Health Nursing— <i>Eva F. MacDougall, R.N.</i> . . . . .	217
Why More County Nurses? A Suggestion from California. Thirty Years of Nurses at Teachers College. The Seattle Community Nursing Service.	
Education and Publicity— <i>Evert G. Routzahn</i> . . . . .	219
Holiday Greetings and Appeals. Five Medical Societies Conduct a Joint Campaign. On Convention Programs. Publicity Portfolios for Conventions. A Nation-Wide Publicity Campaign. The President Believes in Health Education. Offered to Professional Public Health Schools. A Prerequisite to Effective Publicity. Diphtheria "Talkie" Trailers. Headline Producing Copy. Believe It, Or Not. New Publication. Words.	

Continued on page viii

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*Contents—Continued*

	PAGE
Books and Reports . . . . .	225
Microbiology. An Adventure with Children. The Essentials of Healthy Living. Hookworm Disease—Its Distribution, Biology, Epidemiology, Pathology, Diagnosis, Treatment and Control. Clinical Medicine for Nurses. Proceedings of the Third Annual Conference of the Maryland Water and Sewerage Association, Salisbury, Maryland, 1929. Medical Information in Sickness and Health. The Science of Nutrition Simplified. Nature Study and Health Education. Medical Leaders, From Hippocrates to Osler. Creative Activities in Physical Education. Health, What Everyone Ought to Know. Three Minute Medicine. Pathogenic Microorganisms.	
Health Department Reports— <i>Ira V. Hiscock</i> . . . . .	231
Nebraska. Readable Reports. Cattaraugus County, N. Y. Milwaukee, Wis. Los Angeles, Calif. National Sanitarium Association of Toronto. Milbank Memorial Fund.	
A Selected Public Health Bibliography— <i>Raymond S. Patterson, Ph.D.</i> . . . .	235
Books Received . . . . .	237
News from the Field . . . . .	238
Conferences . . . . .	241

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### CONTENTS

	PAGE
Some Special Problems in Atmospheric Pollution . . . . . <i>Abel Wolman</i>	243
Difficulties Encountered in the Control of Mechanical Refrigeration . . . . . <i>Joel I. Connolly, Thomas J. Claffy and John J. Aeberly</i>	252
Problems of Cancer Mortality Statistics . . . . . <i>H. E. Robertson, M.D.</i>	257
Free Clinics for the Preschool Child . . . . . <i>Shirley W. Wynne, M.D., Dr.P.H.</i>	263
Effect of Prenatal Care Upon the Infant . . . . . <i>Clifford G. Grulee, M.D.</i>	269
Effect of Intranatal Care Upon the Infant . . . . . <i>Walter R. Ramsey, M.D.</i>	271
Effect of Antepartum Care of the Mother . . . . . <i>Blanche M. Haines, M.D.</i>	273
Health and Safety Survey of 25 Leading Department Stores in New York . . . . . <i>William Jacobsohn, M.D.</i>	277
The Rôle of the Food Vehicle in Food Poisoning . . . . . <i>Thomas G. Hull, Ph.D., and Lloyd Arnold, M.D.</i>	287
Industrial Methyl Chloride Poisoning . . . . . <i>Herman M. Baker, M.D.</i>	291

### EDITORIAL SECTION

A National Movement for Cleaner Cities . . . . .	296	Respiratory Diseases and Dis- ability . . . . .	299
Streptococci, Tonsils and Rheu- matism . . . . .	297	A New Journal . . . . .	300

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Readers' Guide in your library.

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Continued on page vi

# Want to Get Ahead?



The great English writer, Arnold Bennett, said, "I suppose that for the majority of men the suspension of income for a single month would mean either bankruptcy, the usurer, or acute inconvenience".

A MAN has small chance to get somewhere and be somebody if he is entirely dependent upon his next pay-check. He is likely to be as helpless as a child if his income stops.

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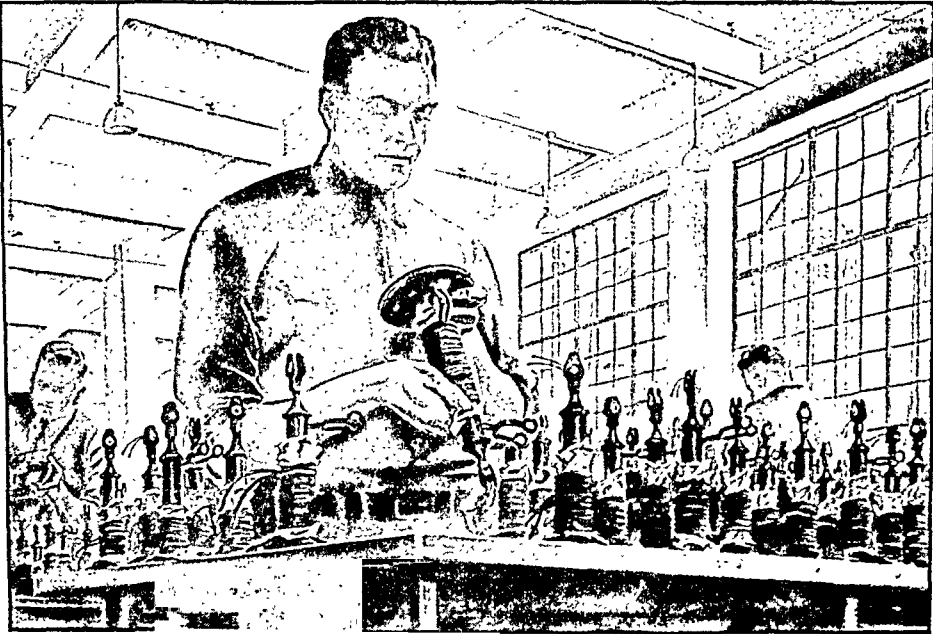
ASSOCIATION NEWS

Plans for the Fort Worth Meeting . . . . .	301
Dates Changed for Western Branch Meeting . . . . .	302
International Congresses at Dresden . . . . .	302
Executive Board Meeting . . . . .	303
Arthur Tomalin . . . . .	305
Health Survey of Washington, D. C. . . . .	305
New Members . . . . .	305
Public Health Administration— <i>Henry F. Vaughan, D.P.H.</i> . . . .	307
Chicken Pox. Financial Aid for County Health Work. Smallpox Prevalence. National Leper Home.	
Laboratory— <i>C. C. Young, D.P.H.</i> . . . . .	308
The Use of Sodium Hypochlorites to Preserve Milk— <i>Walter S. Davis</i> A Low Reading Turbidimeter— <i>August V. Graf</i>	
Vital Statistics— <i>Louis I. Dublin, Ph.D.</i> . . . . .	311
Vital Statistics for 1929. Principal Causes of Death in 1928. Health of New Zealand. Respiratory Infections in Massachusetts in 1928-1929. Incidence of Heart Disease in the Pacific Northwest.	
Public Health Engineering— <i>Arthur P. Miller, C.E.</i> . . . . .	316
Researches on Typhoid Carriers. An Unusual Water Works. The Activated Car- bons and Their Use in Removing Objectionable Tastes and Odors from Waters. B. Coli Isolation on Solid Media: Relation of Direct B. Coli and B. Aerogenes Counts. Increasing Capacity of a German Sludge Digestion Plant. Sludge Dis- posal at the Calumet Sewage Treatment Works. Report of the Investigation of the Pollution of the Mississippi River, Minneapolis to LaCrosse, Inclusive. Lead Poisoning from Lead-Piped Water Supplies. Sewage Treatment in Wisconsin. Oil Mixtures and Oil Equipment for Anopheline Larvae Control of Impounded Areas.	
Industrial Hygiene— <i>Emery R. Hayhurst, M.D., and Leonard Greenburg,     Ph.D.</i> . . . . .	320
Sickness among Industrial Employees. Physiological Factors of Mine Ventilation. Industrial Gas Masks Abroad. Occupational Diseases, Connecticut. Occupational Diseases Investigated in Massachusetts, in 1928. Industrial Partnership. Con- ditions of Work in Spin Rooms. Silicosis Prevention in South African Gold Mines. The Doctor Looks at Child Labor. The Dangers of Carbon Monoxide Poisoning and Measures to Lessen These Dangers. Carbon Monoxide Poisoning in an Automobile. Benzol Poisoning and Its Prevention in the Rubber Industry. Gas Poisoning—Blood Transfusion. Chronic Benzene Poisoning Improved by Liver.	
Food, Drugs and Nutrition— <i>Walter S. Frisbie</i> . . . . .	325
The Distribution of Vitamin A in Some Corn-milling Products. The Vitamin C Content of Fresh Sauerkraut and Sauerkraut Juice. The Vitamin A Content of Yellow and White-Capped Yellow Dent Corn. Effect of Liver Diet on Healthy Organism. Vitamin D Content of the Fat of Marine Mammals.	
Public Health Nursing— <i>Eva F. MacDougall, R.N.</i> . . . . .	328
The High Cost of Nursing. Industrial Nursing Project. Mexico is Using Visiting Nurses.	

Continued on page viii

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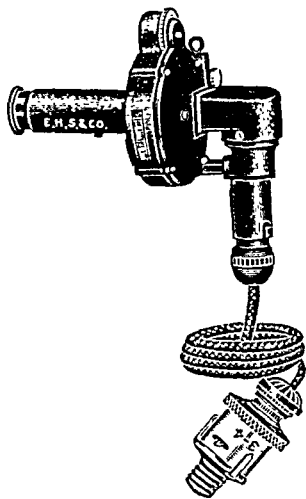


Contents—Continued

	PAGE
Education and Publicity— <i>Evert G. Routzahn</i> . . . . .	330
Slogans in All Languages. How a President Gained and Lost Health. Free But Not for Free Distribution. Health Was First. How Is Your Town? Statistics of Interest to Newspaper Readers. Children and Schools. Reporting. Diphtheria. Regrettable But True. Honorable Mention. Letters. Magazine Articles. Dates Ahead—1930. Graphic Statistics. Try One of These? Lists.	
Books and Reports . . . . .	335
Annals of the Pickett-Thompson Research Laboratory—Vol. V. Aids to Zoölogy. Epidemic Encephalitis. Backgrounds of Biology. The Blood Picture and Its Clinical Significance. The Commonwealth Fund Activities in Austria. Second Annual Report of the Metropolitan Drainage Commission of Minneapolis and St. Paul.	
Health Department and Other Reports— <i>Ira V. Hiscock</i> . . . . .	339
United States Public Health Service. Rosenwald Fund. Cleveland, O. Anderson County, S. C. Cincinnati Public Health Federation. New Jersey. New Haven, Conn.	
Books Received . . . . .	342
A Selected Public Health Bibliography— <i>Raymond S. Patterson, Ph.D.</i> . . . .	343
News from the Field . . . . .	346
Conferences . . . . .	350

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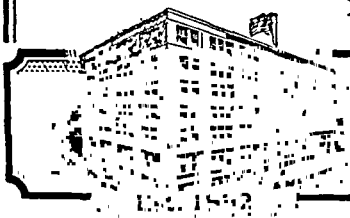
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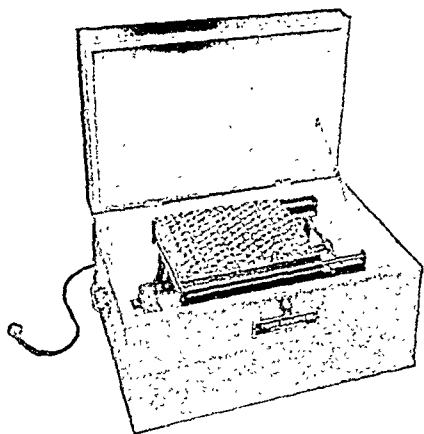
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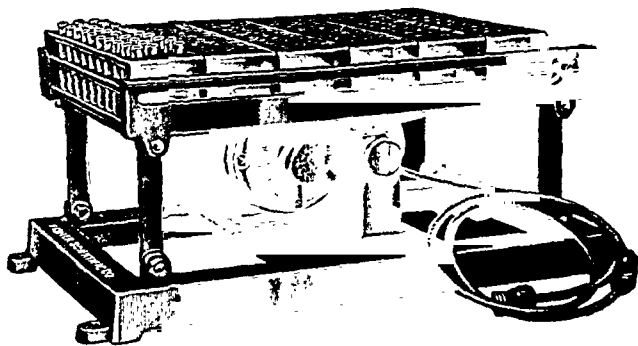
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# American Journal of Public Health

## and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume XX

April, 1930

Number 4

### CONTENTS

	PAGE
Established Points in a Community Program of Health Education . . . <i>Henry F. Vaughan, D.P.H.</i>	351
Water Treatment with Chlorinated Copperas . . . . . <i>A. Clinton Decker and H. G. Menke</i>	357
A Survey Schedule for Industrial Hygiene . . . . . <i>Committee on Administrative Practice</i>	365
Effect of Dust on the Lungs . . . . . <i>Report of the Committee on Silicosis</i>	368
Organization of Local Health Area Statistics in New York City . . . . <i>Godias J. Drolet and William H. Guilfooy, M.D.</i>	380
Vitamin Content of Ethylene-Treated and Untreated Tomatoes . . . . <i>D. Breese Jones, Ph.D., and E. M. Nelson, Ph.D.</i>	387
Seasonal Distribution of Typhoid Fever—Southern and Northern States . <i>G. E. Harmon, M.D.</i>	395
Value of the Newly Identified Types in the Study of the Epidemiology of Pneumococcus Infections . . . . . <i>William H. Park, M.D.</i>	403
Public Health Nursing Legislation—What It Should Include . . . . . <i>Mathilde S. Kuhlman, R.N.</i>	408

### EDITORIAL SECTION

Antirabic Treatment Paralysis . . . . . 412	Forensic Blood Tests . . . . . 414
How Much Toxin-Antitoxin is Necessary . . . . . 413	First International Congress on Mental Hygiene . . . . . 416
History of Fort Worth—59th Annual Meeting City . . . . .	418

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Readers' Guide in your library.

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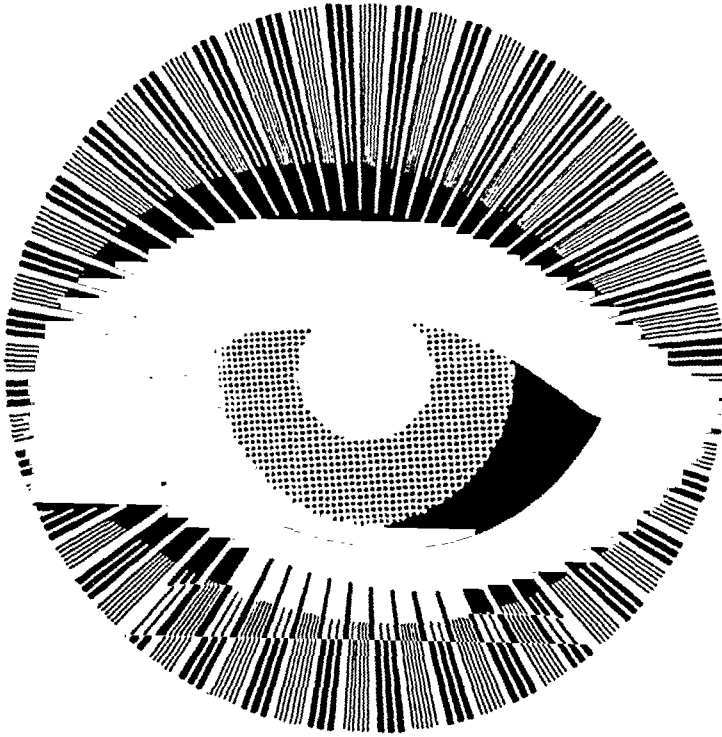
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Continued on page vi

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## Dresden, Germany, May-October, 1930



**D**RESDEN has been selected as the center for the joint meeting of over 200 scientific associations dedicated to the study of hygiene in all its phases.

This international forum—the greatest in its sphere in three decades—will coincide with the opening of the Deutsche Hygiene-Museum, so eagerly awaited by the scientific world.

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## ASSOCIATION NEWS

A. P. H. A. Represented at Latin-American Medical Congress . . . . .	421
New Members . . . . .	421
Public Health Administration— <i>Henry F. Vaughan, D.P.H.</i> . . . . .	423
Diphtheria Problem. Cancer Studies.	
Laboratory— <i>C. C. Young, D.P.H.</i> . . . . .	425
Report of Light Typhoid Outbreak in Whittier, Calif., with Special Reference to the Laboratory Findings— <i>Leonard Heddick</i>	
The Stoltzenberg Differential Stain for Diphtheria Bacilli— <i>Helen H. Owen and Marie Band</i>	
Vital Statistics— <i>Louis I. Dublin, Ph.D.</i> . . . . .	427
Tuberculosis in Early Childhood. Vital Statistics for 1929. Infant Mortality in Bombay.	
Public Health Engineering— <i>Arthur P. Miller, C.E.</i> . . . . .	432
Sewage Disposal. Artificial Means of Influencing the Formation of Ground Water in Flat Country. Water Supply of Hither Pomerania. Sewage Disposal—Johannesburg's New Sludge Digester. The Fertilizing Value of Sewage Sludge. A Study of Lead Poisoning in a Storage Battery Plant. Mastitis—Raw Milk Combination Causes Another Epidemic. Pre-Determining the Extent of a Sewage Field in Sea Water. Technical Aspects of the Prevention of Pollution of Rivers by Domestic Sewage and Trade Wastes. Sewage Plants and Mosquito Propagation. On the Nature and Removal of Effluents from the Brown Coal Industry.	
Industrial Hygiene— <i>Emery R. Hayhurst, M.D., and Leonard Greenburg, Ph.D.</i> . . . . .	436
Lead Poisoning. Occupational Diseases in 1929 Show Lead Poisoning Led in Fatalities. New Rule Applying to Minors Employed in Spray Coating Operations. Laboratory Facilities to Assist Industry. Compensable Occupational Disease Institute. Small Arms Ammunition. Industrial Medicine. Western Electric Company Experiment.	
Food, Drugs and Nutrition— <i>Walter S. Frisbie</i> . . . . .	441
The Effect of Cod Liver Oil Feeding on the Calcium and Phosphorus Content of Cows' Milk. The Influence of Different Samples of "Casein" on Vitamin Tests. The Epidemiology of Paratyphoid Infections. "Food Poisoning" Produced in Monkeys by Feeding Living Salmonella Cultures. The Effect of Grape Juice on Nitrogen Retention and Urinary Acidity. Hypervitaminosis and Vitamin Balance, IV.	
Public Health Nursing— <i>Eva F. MacDougall, R.N.</i> . . . . .	445
Miss Fox Goes to New Haven. The Public Health Nurse and Social Hygiene. The Institute for Lay Boards in Chicago. A High School State Board of Health.	
Education and Publicity— <i>Ewart G. Routzahn</i> . . . . .	448
Joyous Living Longer in Syracuse. Education in Clinics. Health Demonstration Before Rotary Club. More Statistics in State Press Releases. Social Work Publicity at Boston in June. The Beginnings of Health Education-Publicity. New England Health Institute. A Division of Public Health Education. Again General Warnings are Questioned. Photographs Wanted. Forms of Printed Matter. Propaganda. Radio. Dates Ahead. Diphtheria. Educational Material. Press Releases. Motion Pictures.	

Continued on page viii

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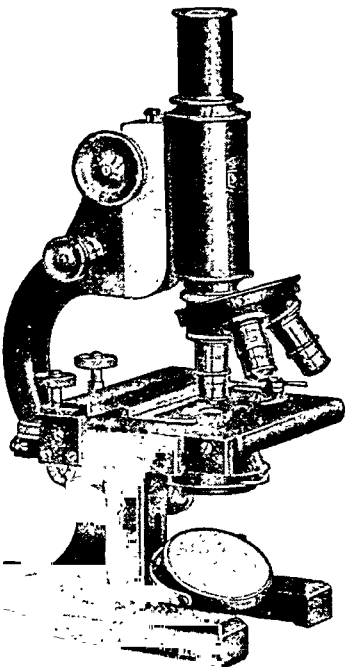
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*Contents—Continued*

	PAGE
Books and Reports . . . . .	453
A Book of Crimes. Disease and the Man. The Road to Health. Health Work in Soviet Russia. Healthful Living. Schistosomiasis and Malaria in Relation to Irrigation. Second Annual Report of Ohio Conference on Sewage Treatment. Practical Handbook for Diabetic Patients. Report of the Westchester County Sanitary Sewer Commission, 1929. The Hebrew Physician. Home Nursing and Child Care. Handbook of Bacteriology for Nurses. Feeding the Family. The Medical Museum. Pathogenie et traitement de l'asthme bronchique.	
A Selected Public Health Bibliography— <i>Raymond S. Patterson, Ph.D.</i> . .	459
Health Department and Other Reports— <i>Ira V. Hiscock</i> . . . . .	461
Newton, Mass. New York State. Montreal. Arizona. Newark, N. J. Bridgeport, Conn. New Jersey.	
Books Received . . . . .	464
News from the Field . . . . .	465
Conferences . . . . .	468



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May, 1930

Number 5

### CONTENTS

	PAGE
Pre-disaster Preparedness . . . . . <i>Report of the Committee on Disaster Relief</i>	469
Public Health and Medical Problems in Disasters . . . . . <i>William DeKleine, M.D.</i>	479
Bacterial Aftergrowths in Water Distribution Systems . . . . . <i>Report of the Committee on Water Supply</i>	485
Discussion . . . . . <i>Chester Cohen</i>	489
Bacteriological Basis for the Effective Pasteurization of Ice Cream . . . . . <i>Report of the Committee on Dairy Products and Eggs</i>	492
Study of the Effects of 736 Tonsillectomies and of 741 Controls . . . . . <i>John D. Monroe, M.D., and V. K. Volk, M.D., Dr.P.H.</i>	495
The Minimal "Chlorine Death Points" of Bacteria . . . . . <i>Fred O. Tonney, M.D., Frank E. Greer, and George F. Liebig, Jr.</i>	503
The Sanitary Aspects of Refuse Collection and Disposal . . . . . <i>Report of the Committee on Refuse Collection and Disposal</i>	509

### EDITORIAL SECTION

Serum Treatment of Meningitis	518	Sewage and Conservation	520
Health Councils	519		
The Host City for 1930 . . . . . <i>Ira C. Chase, M.D.</i>			522

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Readers' Guide in your library.

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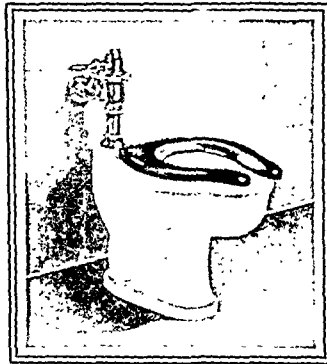
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Continued on page vi

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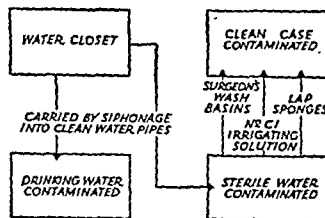
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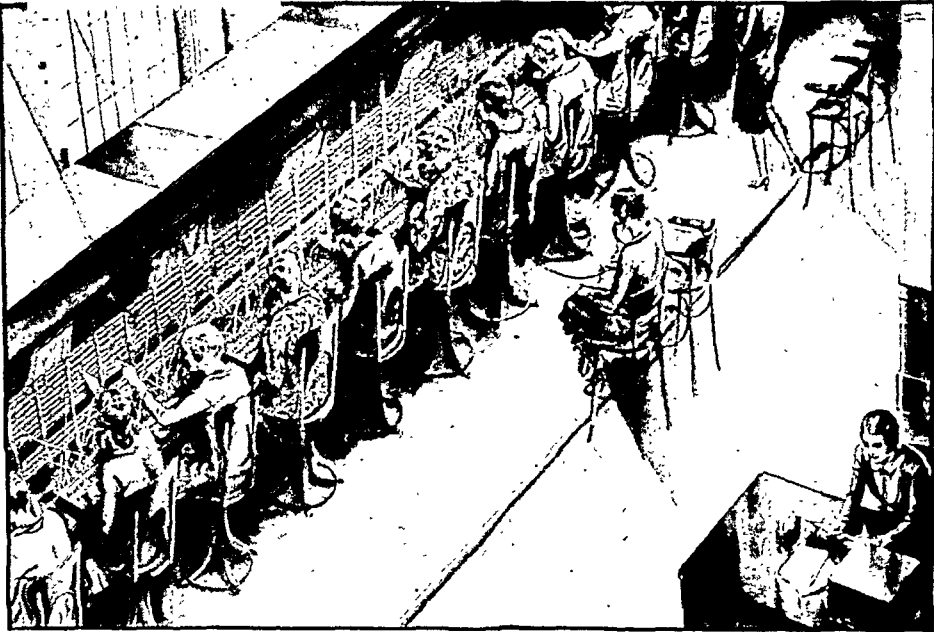
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# ASSOCIATION NEWS

Meeting of the Executive Board . . . . .	524
Nominations for the Governing Council . . . . .	526
Committee on Annual Meeting Program . . . . .	527
Announcing Unusual 10-Day Post-Convention Tour to Mexico City from Fort Worth . . . . .	528
Tentative Program—First Meeting Western Branch, American Public Health Association . . . . .	529
New Members . . . . .	531
Applicants for Fellowship . . . . .	532
Public Health Administration— <i>Henry F. Vaughan, D.P.H.</i> . . . . .	534
Health Inventory of New York City. School Health Service in New York City. Health Administration in Racine, Wis. Epidemiological Studies in New Haven, Conn.	
Laboratory— <i>C. C. Young, D.P.H.</i> . . . . .	536
An Improved Technic in Burri's Method of Isolating Obligately Anaerobic Bac- teria— <i>Ivan C. Hall, Ph.D.</i> Inoculating Needles— <i>E. G. Hastings</i>	
Vital Statistics— <i>Louis I. Dublin, Ph.D.</i> . . . . .	539
Influence of Nonresident Deaths on Boston's Death Rate. Maternal Mortality. Age Distribution of Influenza Deaths in Cleveland, O., 1918-1929. The Problem of Diabetic Mortality. Prevention and Treatment of Pneumonia. Health of Palestine. Public Health in Kenya.	
Public Health Engineering— <i>Arthur P. Miller, C.E.</i> . . . . .	543
A Typhoid Fever Epidemic in the Far North— <i>F. M. Brickenden.</i> The Munich Sewage Treatment Plant. Innovations in the Chemical Purification of Drinking Water and Information on the Present Application of Activated Carbon and Earth. The Anthrax Danger in Lahr and Its Removal. Methyl Chloride Poison- ing from Domestic Refrigerators. Some Examples of Pollution of Streams by Industrial Wastes. How Wilmington (Del.) Has Raised the Sanitary Standards of Its Nine Swimming Pools.	
Industrial Hygiene— <i>Emery R. Hayhurst, M.D., and Leonard Greenburg,</i> <i>Ph.D.</i> . . . . .	548
The Present Status of Industrial Medicine. Will the Inhalation of Siliceous Dusts Activate a Partially Healed Focus of Tuberculous Infection? A New Journal in the Field. Industry in Relation to Personal and Public Health. Some Facts about Pennsylvania Women Wage Earners. Women in Trade Unions. Sugar. Composition Roofing.	
Food, Drugs and Nutrition— <i>Walter S. Frisbie</i> . . . . .	553
Cereals and Rickets, III. The Effect of Vitamin D and of Reaction of Diet upon Response to Parathyroid Extract. Irradiated Products and the Public Health. The Escherichia-Aerobacter Group as an Index to Proper Pasteurization. An Outbreak of Food Poisoning Caused by Salmonella Enteritidis.	

Continued on page viii

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Contents—Continued

	PAGE
Public Health Nursing— <i>Eva F. MacDougall, R.N.</i> . . . . .	556
The Rural Nurse as a Case Worker. To Urban Official Public Health Nursing Agencies. The Private Physician and the Public Health. Public Health Nursing in a City Board of Health.	
Education and Publicity— <i>Evert G. Routzahn</i> . . . . .	558
Health Education in Clinics. Reports of Health Surveys. What Topic and When? International Health Exposition. Health Education, Etc. News Releases. True vs. False Teaching. Awards for Health Material at Boston. Dr. Biggs Believed in Health Education. Honorable Mention. Reporting. Contests. Radio. Educational Material.	
Books and Reports . . . . .	563
Recent Advances in Preventive Medicine. Psychology and Industrial Efficiency. Milk and Milk Products. The Art of Rapid Reading. Bergey's Manual of Determinative Bacteriology. The Visiting Teacher at Work. Our Baby's First Seven Years. Burdett's Hospitals and Charities, 1930. The Rat, a World Menace. A System of Bacteriology in Relation to Medicine, Vol. IV. The Village Doctor.	
A Selected Public Health Bibliography— <i>Raymond S. Patterson, Ph.D.</i> . . .	569
Health Department Reports— <i>Ira V. Hiscock</i> . . . . .	572
Connecticut. Palo Alto, Calif. Racine, Wis. Ottawa, Can. Vienna, Austria. Sacramento, Calif.	
Books Received . . . . .	575
News from the Field . . . . .	576
Summer School Courses in Public Health.	
Conferences . . . . .	580

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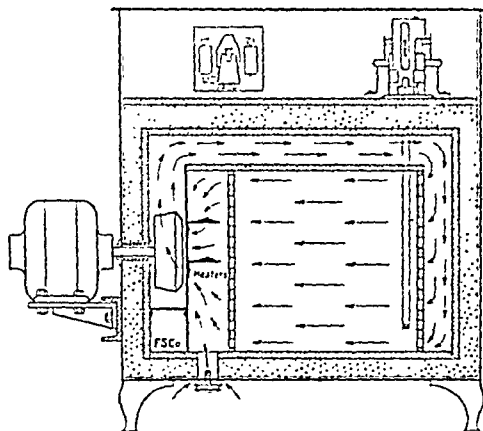
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### CONTENTS

	PAGE
Cancer Death Rates, Smoke and Topography . . . . . <i>Jerome Meyers, M.D.</i>	581
Health and Welfare in Honolulu, Hawaii . . . . . <i>Frederick E. Trotter, M.D., and Ira V. Hiscock</i>	589
Hydrogen Sulphide in Industry—Occurrence, Effects, and Treatment . . . <i>W. P. Yant</i>	598
Are the Indians Dying Out? . . . . . <i>Frederick L. Hoffman, LL.D.</i>	609
Thermal Death Points of Pathogenic Bacteria in Cream and Ice Cream . . <i>Carolyn Oldenbusch, Martin Frobisher, Jr., and J. H. Shrader, Ph.D., M.D.</i>	615
Financing Home Sanitary Facilities on the Easy Payment Plan . . . . . <i>Report of the Committee on Rural Sanitation</i>	619
Epidemiology in State and City Health Organizations . . . . . <i>John A. Ferrell, M.D., Dr.P.H.</i>	623
Improved Practical and Economical Methods of Mosquito Control . . . . <i>Report of the Committee on Mosquito Control</i>	628
Inter-Chamber Health Conservation Contest . . . . . <i>William Butterworth</i>	633

### EDITORIAL SECTION

Progress on Federal Health Correlation . . . . .	638	Accepted Foods . . . . .	640
		Health Contest Awards . . . .	641

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Readers' Guide in your library.

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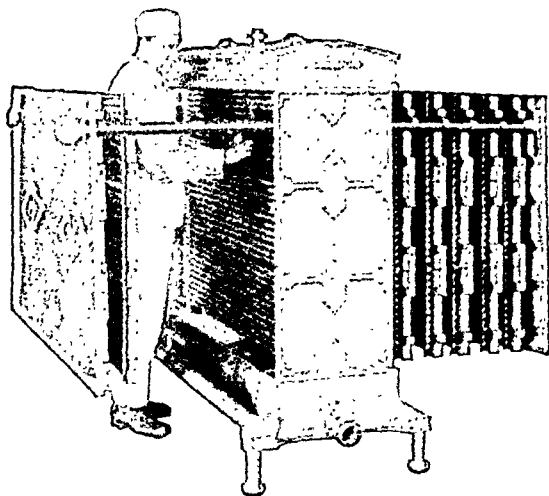
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Continued on page vi



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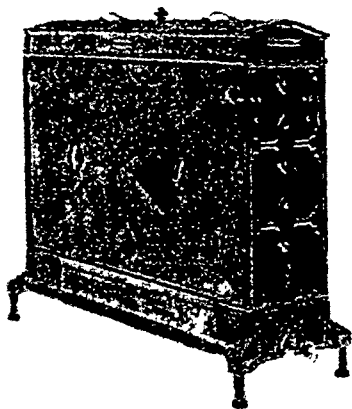
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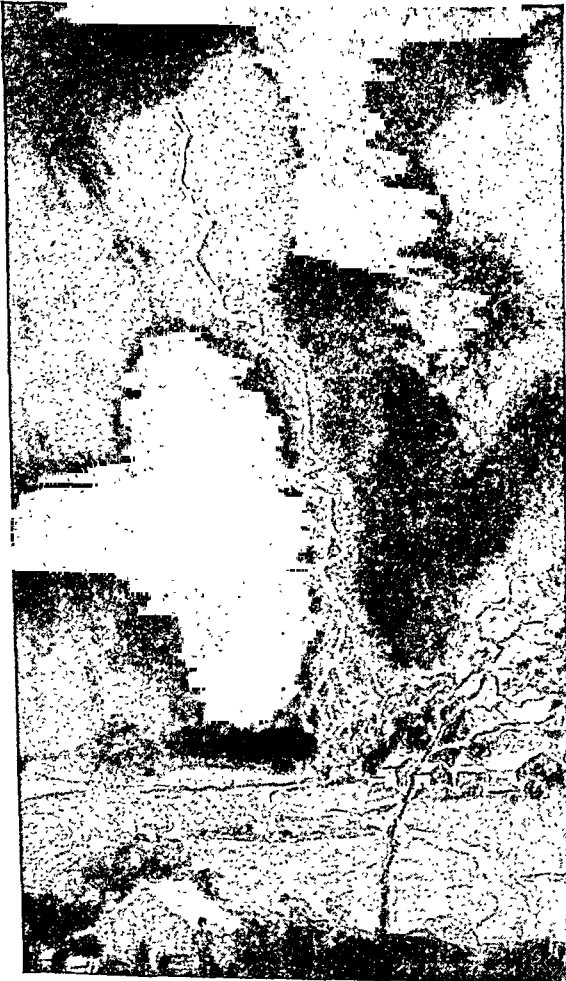
	PAGE
ASSOCIATION NEWS	
The Fifty-Ninth Annual Meeting . . . . .	643
Guy L. Kiefer Dies . . . . .	644
Hotel Reservation Blank for Fort Worth Meeting . . . . .	644
Annual Meeting Information . . . . .	645
Fort Worth Hotels	
Reduced Railroad Rates	
Railroad Rates from Various Centers to Fort Worth	
Fort Worth's Hotels, Showing Location, Number of Rooms and Rates	
City of Fort Worth Business Section (Map) . . . . .	646
New Members . . . . .	647
Public Health Administration— <i>Henry F. Vaughan, D.P.H.</i> . . . . .	648
Cost of Medical Care. Tuberculosis in New York City. Tuberculosis in New Haven. Refrigerating Systems. Scarlet Fever in Syria. Hookworm in Alabama. Philadelphia Hospital and Health Survey. The Influence of Non-Resident Deaths upon the General Death Rate in Large Cities.	
Laboratory— <i>C. C. Young, D.P.H.</i> . . . . .	653
Muer's Bacterial Counting Stand— <i>Frank E. Hale, Ph.D.</i>	
The DDE—A New Research Microscope for the Scientist— <i>R. W. Abell</i>	
Vital Statistics— <i>Louis I. Dublin, Ph.D.</i> . . . . .	656
Maternal Mortality in America. Poliomyelitis in Maryland. Poliomyelitis in Ottawa, 1929. Rheumatic Disease in Children. Public Health in Iraq.	
Public Health Engineering— <i>Arthur P. Miller, C.E.</i> . . . . .	659
Basing Sewage Works Requirements on Stream Pollution Studies. The Sewage Treatment Plant of Konigsberg, Prussia. An Activated Sludge Plant with Novel Features. The Dewatering of Sewage Screenings. The Significance of <i>B. coli</i> in Water. Some Troublesome Weeds Found in Water Supplies. A Study of Hookworm Infestation in the Field. Sterilization of Dairy Utensils with Humidified Hot Air. The Bottled Mineral Waters. Town Penalized for Failure to Chlorinate.	
Industrial Hygiene— <i>Emery R. Hayhurst, M.D., and Leonard Greenburg, Ph.D.</i> . . . . .	664
On the Diagnosis and Treatment of Lead Poisoning. Miners' Nystagmus and Incapacity for Work. Proposed Standard Smoke Ordinance. Typewriting and Lead Poisoning. "The Healthy Worker."	
Food, Drugs and Nutrition— <i>Walter S. Frisbie</i> . . . . .	669
Long Time Feeding Experiments with Activated Ergosterol. Feeding of Salmonella Enteritidis to Rats on Diets Varying in Vitamin A Content. Botulism Resulting from Consumption of Canned Onions. A Study of the Vitamin B Complex of Red Kidney Beans and Polished Rice. Studies on the Destruction of Vitamin C in the Boiling of Milk.	

Continued on page viii

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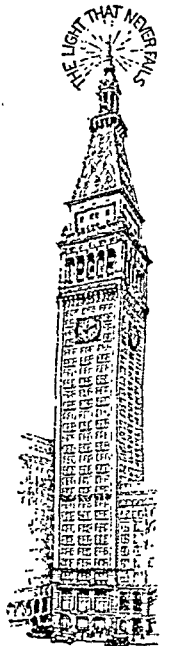
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### *Contents—Continued*

	PAGE
Public Health Nursing— <i>Eva F. MacDougall, R.N.</i> . . . . .	672
The First Trained Nurse in America Dies. More about Industrial Nursing. Public Health Nurses and Committees.	
Education and Publicity— <i>Evart G. Routzahn</i> . . . . .	675
Schools and Children. Girls. Diphtheria. Art. Film Slides. Magazine Arti- cles. Safety. Posters. New Names. Psittacosis. Reading Lists. Regrettable —Unnecessary. Public Education in Mental Hygiene.	
Books and Reports . . . . .	679
The Psychology of Learning Applied to Health Education through Biology. Physiology and Health. How Great Cities are Fed. The Physiology of Oral Hygiene and Recent Research. Insects, Ticks, Mites and Venomous Animals of Medical and Veterinary Importance. The Healthy Mind. National Conference of Social Work at San Francisco, June, 1929. Control of Endemic Diseases in the Netherlands Indies. The Alien in our Midst. The Epidemiology and Con- trol of Malaria in Palestine. Laboratory Testing of Germicides and Chemo- Therapeutic Agents. Lehrbuch der Protozoenkunde. Lead Poisoning. Diag- nostica e Tecnica di Laboratorio.	
Health Department and Other Reports— <i>Ira V. Hiscock</i> . . . . .	685
Washington, D. C. Territory of Hawaii. The Commonwealth Fund. San Jose, Calif. Greenville, S. C.	
Books Received . . . . .	688
A Selected Public Health Bibliography— <i>Raymond S. Patterson, Ph.D.</i> . . . .	689
News from the Field . . . . .	692
Conferences . . . . .	695

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July, 1930

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### CONTENTS

	PAGE
Health Aspects of a Summer Recreation . . . . . <i>Charles F. Dalton, M.D.</i>	697
Technical Supervision in the Production of Highest Quality Milk . . . . . <i>John G. Hardenbergh, V.M.D.</i>	705
What Is a Preventorium? . . . . . <i>H. E. Kleinschmidt, M.D.</i>	715
Care of Communicable Diseases in General Hospitals . . . . . <i>James Wallace, M.D.</i>	722
Administration of Swimming Pool Standards in Detroit . . . . . <i>William H. Cary, Jr.</i>	727
What Preparation Should the Public Health Nurse Have for Rural Work? . . . . . <i>I. Malinde Havey, R.N.</i>	734
Bacteriological Control in Commercial Canning . . . . . <i>E. J. Cameron, Ph.D., and H. M. Loomis</i>	741
The Well Baby Clinic at the Office of the Family Physician and Pediatrician . . . . . <i>E. J. Hueneckens, M.D.</i>	747
Waterways Pollution . . . . . <i>Report of the Committee</i>	751

### EDITORIAL SECTION

Psittacosis . . . . .	756	Congress Authorizes National Institute of Health . . . . .	760
What is the Saturation Point for City Noise? . . . . .	758		

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Readers' Guide in your library.

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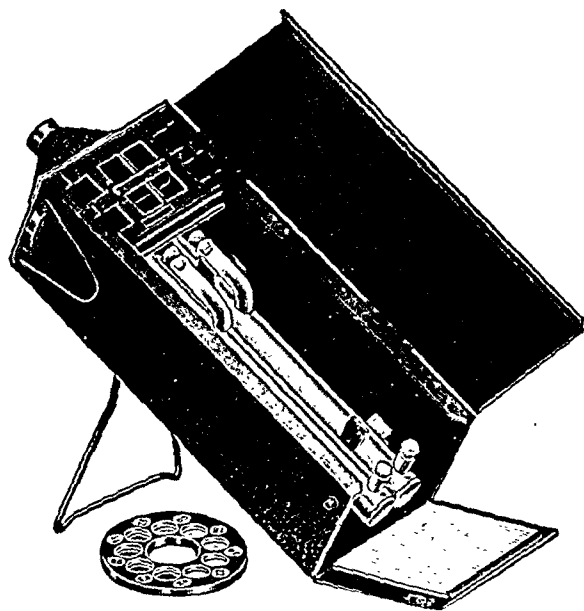
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Continued on page vi

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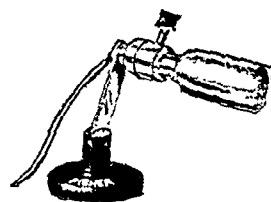
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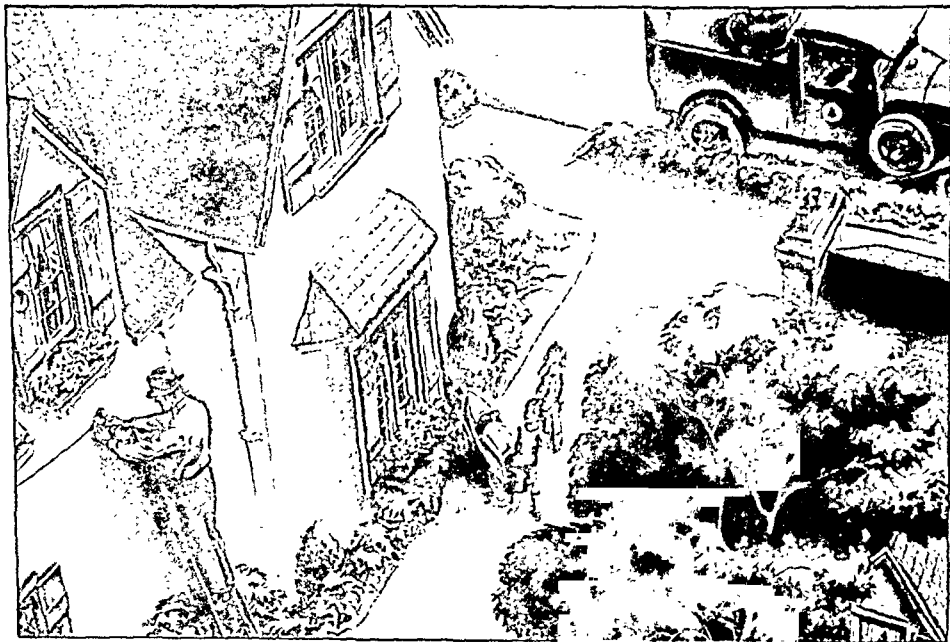
## ASSOCIATION NEWS

A Nine-day All-expense Tour, with 5 Days in Mexico City . . . . .	761
Other Meetings in Fort Worth . . . . .	764
Dr. Slemons Michigan's New Commissioner of Health . . . . .	765
Death of Samuel M. Heulings . . . . .	765
German Hygiene Museum . . . . .	765
Western Branch, A. P. H. A. . . . .	766
New Members . . . . .	767
Public Health Administration— <i>Henry F. Vaughan, D.P.H.</i> . . . . .	769
Providence, R. I., Survey. Municipal Expenditures for Public Health. Rural Health Service.	
Laboratory— <i>C. C. Young, D.P.H.</i> . . . . .	771
Description of a New Mechanical Disintegrator— <i>E. W. Schultz, M.D., and F. D. Bankam</i>	
Electric Kjeldahl Nitrogen without Fume Hood— <i>W. D. Stovall, M.D., and M. Starr Nichols, Ph.D.</i>	
Vital Statistics— <i>Louis I. Dublin, Ph.D.</i> . . . . .	774
Vital Statistics for England and Wales, 1929. Vital Statistics for Scotland, 1929. Vital Statistics for Irish Free State, 1929. Age-Sex-Seasonal Incidence of Certain Diseases in Children. The Homicide Record for 1929. Insured of Metropolitan Life Insurance Company.	
Public Health Engineering— <i>Arthur P. Miller, C.E.</i> . . . . .	777
Bacteria of the Coli Group in the Intestines of Birds and Their Importance in the Fecal Pollution of Water. Successive Separation in Sewage Disposal Systems. Activated Sludge Process for Sewage Disposal. Power Gas from Sewage Sludge. Studies on Yellow Fever in South America. Enumeration of the Anaerobic Sulphite Reducing Bacteria and the Significance of Their Presence in Water. A Study of the Possibilities of Transmitting Yellow Fever by Means of Stegomyia Excreta.	
Industrial Hygiene— <i>Emery R. Hayhurst, M.D., and Leonard Greenburg, Ph.D.</i> . . . . .	780
Toxicity of Dichloro-Difluoro Methane: A New Refrigerant. Warning Agents for Methyl Chloride in Refrigeration Systems. Observations on the Possibility of Methyl Chloride Poisoning by Ingestion with Food and Water. Titanium Oxide Pigments. Causes of Death by Occupation. An Experimental Study of Abnormalities Produced in the Organism by Electricity. Proceedings of the Twenty-fifth Anniversary Conference of the National Child Labor Committee held in New York City, December 16-17, 1929. Control of the Silicosis Hazard in the Hard Rock Industries. Occupation and Health. The Comparative Action of 5 and 10 per cent Carbon Dioxide Mixtures as Respiratory Stimulants in Carbon Monoxide Poisoning. The Quantitative Measurement of Human Efficiency under Factory Conditions.	
Food, Drugs and Nutrition— <i>Walter S. Frisbie</i> . . . . .	785
On the Nature and Rôle of the Fatty Acids Essential in Nutrition. Effect of the Varying Amounts of Menhaden Oil in the Diet on the Composition of the Body Fat of the White Rat. Studies of Vitamin C in Fresh and Canned Tomatoes. Further Evidence for a Third Accessory "B" Factor. Heat Resistance of the Spores of Clostridium Botulinum.	

Continued on page viii

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Contents—Continued

	PAGE
Public Health Nursing— <i>Eva F. MacDougall, R.N.</i> . . . . .	788
The Public Health Nurse and Communicable Disease. Public Health Nurses in Michigan, 1929–1930. The Staff Education Plan in Montreal. We Need a Higher Standard of Admission to Nursing Schools.	
Education and Publicity— <i>Evart G. Rontzahn</i> . . . . .	791
A Neighborhood Demonstration. Welcome to a Guest Editor. Early Diagnosis Campaign. Health Education in a Professional Magazine. Why Not the Silent Film? Publicity Task of Mental Hygiene. Magazine Articles.	
Books and Reports . . . . .	795
The Story of San Michele. The Diagnosis of Health. What is Eugenics? Shattering Health Superstitions. The Immunology of Parasitic Infections. Factors in the Sex Life of Twenty-Two Hundred Women. Sewerage and Sewage Disposal. Through the States with a Seeing Eye. Values and Methods in Health Education. Gewinnung und Kontrolle der Trinkmilch. The Hygiene of the School Child. A Handbook of the Mosquitoes of North America. Health Heroes—Edward Livingston Trudeau. The Biological Basis of Human Nature. A Textbook of Physiology for Nurses. The Health Care of the Baby. A Health Revue.	
A Selected Public Health Bibliography— <i>Raymond S. Patterson, Ph.D.</i> . . . .	804
Health Department and Other Reports— <i>Ira V. Hiscock</i> . . . . .	806
Sweden—Report of Official Committee on Maternity Welfare Work. Let There Be Sight. Lincoln, Neb. Colorado Springs, Colo. Ottawa, Can. Greenwich, Conn. New Jersey Sanatoriums. Detroit, Mich. Newport, R. I.	
Books Received . . . . .	810
News from the Field . . . . .	811
Conferences . . . . .	814

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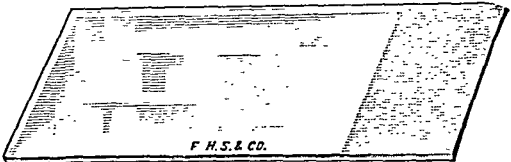
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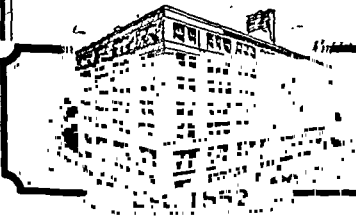
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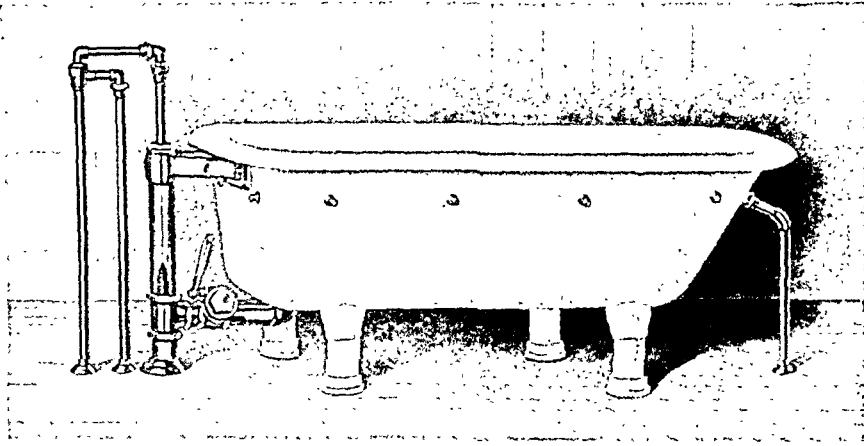
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## and THE NATION'S HEALTH

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Volume XX August, 1930 Number 8

### CONTENTS

	PAGE
Significance of Thermophilic Bacteria in Pasteurized Milk . . . . . <i>L. A. Rogers, D.Sc., and W. C. Frazier, Ph.D.</i>	815
Hygiene of the Towel . . . . . <i>Herbert D. Pease, M.D., and Lester C. Himebaugh</i>	820
Problems in Public Health Administration . . . . . <i>George C. Ruhland, M.D.</i>	833
Report of Visits to Local Registrars of Vital Statistics in Maryland . . . . <i>John Collinson, M.D., Dr.P.H.</i>	839
Discussion— <i>W. Thurber Fales</i> . . . . .	841
Elusive Features in the Epidemiology of the Common Cold . . . . . <i>Wade H. Frost, M.D.</i>	843
Hospital Facilities for the Treatment of Cancer . . . . . <i>Susan M. Wood</i>	849
Training and Personnel . . . . . <i>Report of the Committee</i>	855

### EDITORIAL SECTION

Mental Hygiene . . . . .	858	Cancer . . . . .	860
Constitution and By-Laws, and Constitution for Sections, American Public Health Association . . . . .			862

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Readers' Guide in your library.

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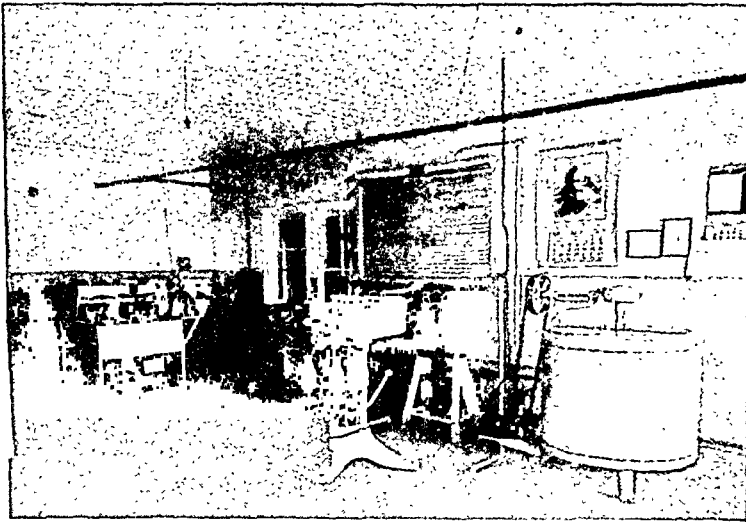
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Continued on page vi

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ASSOCIATION NEWS

Inspection Trips, Rodeo and Barbecue for A. P. H. A. Convention, Fort Worth— <i>A. H. Flickwir, M.D.</i> . . . . .	869
Announcement, Annual Meeting Program . . . . .	871
New Members . . . . .	872
Public Health Administration— <i>Henry F. Vaughan, D.P.H.</i> . . . . .	874
Control of Scarlet Fever. The Tragedy with BCG Vaccine at Lübeck. Public Health Administration.	
Laboratory— <i>C. C. Young, D.P.H.</i> . . . . .	878
A Rapid Method of Using the Sabin Slide Microscopic Test for Determining the Types of Pneumococci— <i>Jesse G. M. Bullowa, M.D., and Audrey H. Schuman</i> A Convenient Mixing Can for Use in Preparing Diphtheria Toxin-Antitoxin Mixture— <i>George F. Leonard, M.D.</i>	
Vital Statistics— <i>Louis I. Dublin, Ph.D.</i> . . . . .	881
Smallpox in the United States and Canada, 1929. Rheumatic Fever in Children. Obstetric Costs. The Suicide Record for 1929. Airplane Fatalities. Diphtheria Mortality in United States Cities, 1929. Vital Statistics for Spain.	
Public Health Engineering— <i>Arthur P. Miller, C.E.</i> . . . . .	885
Overnight Camps. Progress in Water Purification. Chloramines in the Disinfection of Water. Dechlorination of Water by Activated Carbon. Odor Control at the Macon Sewage Plant. Living Tubercle Bacilli in a Septic Tank Effluent. Results of Tests on Sewage Sludge. 2,300 Tons of Pollution Afloat in Manhattan Atmosphere. The Effect of an Alternating Electric Current on Tubercle Bacilli in Milk.	
Industrial Hygiene— <i>Emery R. Hayhurst, M.D., and Leonard Greenburg, Ph.D.</i> . . . . .	890
Report of Industrial Hygiene Committee: State and Provincial Health Authorities of North America. I. Classified Index of Occupations. II. Alphabetical Index of Occupations. Household Mechanical Refrigeration. Refrigeration. Diagnosis of Silicosis. Sixth International Congress for Accident Surgery and Labor Medicine. Organic Fluorides as Refrigerants. A Study of Silicosis in Rock Drillers.	
Food, Drugs and Nutrition— <i>Walter S. Frisbie</i> . . . . .	894
The Blacktongue-Preventive Value of Lard, Salt Pork, Dried Green Peas, and Canned Haddock. Vitamin A and Carotene. Bacteria of the Upper Respiratory Tract and Middle Ear of Albino Rats Deprived of Vitamin A. Brucella Agglutinins in the Blood and Milk of Cows. Beef Extract as a Source of Vitamin G. The Oxalic Acid Content of Vegetables Used as Greens. Cows Infected with Streptococcus Epidemicus (Davis). Vitamin C Content of Three Samples of Japan Green Tea.	
Public Health Nursing— <i>Eva F. MacDougall, R.N.</i> . . . . .	898
Canada Has This Problem, Too. Of Interest to School Nurses. Heard at the Biennial Nurses' Convention at Milwaukee in June. Recruiting.	
Education and Publicity— <i>Evert G. Routzahn</i> . . . . .	901
A Public Health Nurse Informs Her Public. "Telling Marie Over the Telephone." Health Education Pioneer. Publicity Exhibits at Fort Worth. A Proposition for National and State Agencies. Social Hygiene in a Y. M. C. A. Remember the Guest Editor. Again the Annual Meeting! The Public Health Worker's Vacation. What? When? Who? Why?. What About Billboards? Health "Best Sellers." Believe It or Not. Epitaph. A Request. Honorable Mention. New. Educational Material. Schools—Children. Timely Topics. Contest—Stories.	

Continued on page viii

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Contents—Continued

	PAGE
Books and Reports . . . . .	906
Practical Psychology and Psychiatry. Bio-Dynamics: The Battle for Youth. Your Nose, Throat and Ears. New Uses for Capital. Undulant Fever and Contagious Abortion. Gesundheitswesen und Wohlfahrtspflege im Deutschen Reiche. Public Health Aspects of Dental Decay in Children. Social Control of the Mentally Deficient. 1930 Municipal Index. A Survey of the Law Concerning Dead Human Bodies. Statistical Reference Data. Our New Religion—An Examination of Christian Science. Yourself, Inc.: The Story of the Human Body. Etudes sur le Cholera. Sanitation, Hygiene, Bacteriology and Sterilization. An Index to the Chemical Action of Microorganisms on the Non-Nitrogenous Organic Compounds. History of Nursing and Sociology. The Social Worker in Family, Medical and Psychiatric Social Work. Symposium on Physical Education and Health. Insomnia—How to Combat It.	
Health Department and Other Reports—Ira V. Hiscock . . . . .	915
Milwaukee, Wis. Saskatchewan, Can. Mississippi Flood Disaster. Macon City and Bibb County, Ga. Brookline, Mass. Lowndes County, Ga. Glendale, Calif. Dayton, O.	
A Selected Public Health Bibliography—Raymond S. Patterson, Ph.D. . . . .	918
Books Received . . . . .	920
News from the Field . . . . .	921
Conferences . . . . .	923

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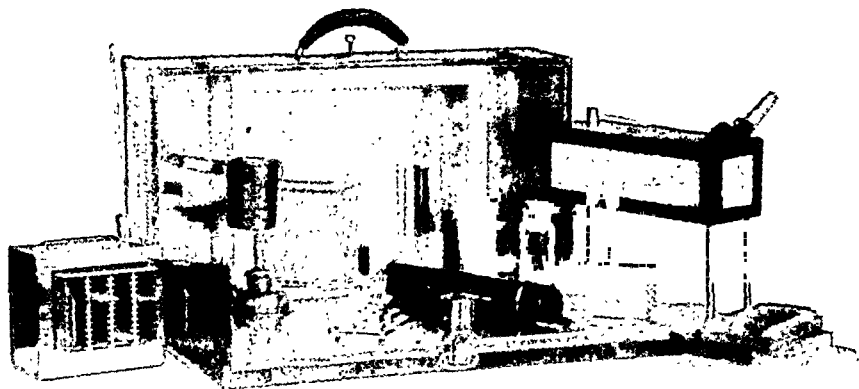
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Volume XX

September, 1930

Number 9

---

### CONTENTS

	PAGE
The Pan American Sanitary Bureau . . . . . <i>Bolivar J. Lloyd, M.D.</i>	925
How the Nurse Can Help the Health Officer to Get His Message Across . . . . . <i>Henry F. Vaughan, D.P.H.</i>	930
Animal Infections with Bacteria of Genus <i>Brucella</i> and Their Relation to Undulant Fever of Man . . . . . <i>J. Traum</i>	935
Mental Hygiene in a Public Health Program . . . . . <i>James L. McCartney, M.D.</i>	943
Pulmonary Tuberculosis in Students . . . . . <i>Lee H. Ferguson, M.D.</i>	955
Physical Measurements of One Thousand Smith College Students . . . . . <i>Faith Fairfield Gordon, M.D.</i>	963
Tuberculous Patients in New Jersey Sanatoriums . . . . . <i>Emil Frankel and Helen E. Heyer</i>	969

### EDITORIAL SECTION

Mexican Leadership in Public Health . . . . .	978	Mouth Spray and Puerperal Fever . . . . .	982
The Ship Doctor and Public Health . . . . .	981		

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Readers' Guide in your library.

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Continued on page vi

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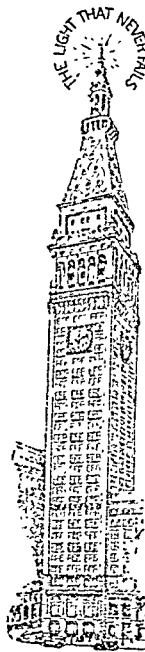
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	PAGE
Preliminary Program of the Fifty-Ninth Annual Meeting . . . . .	984

ASSOCIATION NEWS

Fifty-Ninth Annual Meeting . . . . .	1000
Some Members of the Local Committee . . . . .	1000
Welcome to Texas— <i>Mrs. O. E. Carr</i> . . . . .	1000
Women's Entertainment Committee— <i>Mrs. Henry B. Trigg</i> . . . . .	1002
Invitation to Visit San Antonio . . . . .	1003
New Members . . . . .	1003
Applicants for Fellowship . . . . .	1005
Fort Worth Hotel Reservations . . . . .	1005
Public Health Administration— <i>Henry F. Vaughan, D.P.H.</i> . . . . .	1006
Nursing Technic in Minneapolis. Undulant Fever. Diphtheria Prevention in New York. Public Health in Iowa. Tuberculosis Service in Cattaraugus County. Los Angeles County Health Department.	
Laboratory— <i>C. C. Young, D.P.H.</i> . . . . .	1009
Preparation of Acidophilus Milk from Milk Treated by Electricity— <i>E. D. Devereux</i>	
An Improved Drying Plate— <i>M. O. Robinson, V.M.D.</i>	
Detection of Indol in Bacterial Cultures— <i>D. C. B. Duff</i>	
Vital Statistics— <i>Louis I. Dublin, Ph.D.</i> . . . . .	1014
Post-Sanatorium Histories of Tuberculous Cases. Marriage and Divorce Reports, 1929. German Cancer Statistics. Population Decreases in German Cities. Body Weight and Certain Causes of Death. The Causes of Neonatal Deaths.	
Public Health Engineering— <i>Arthur P. Miller, C.E.</i> . . . . .	1018
Sanitation of "Pullman Cities" at Shrine Convention— <i>J. Ross Menzies</i>	
Industrial Hygiene— <i>Emery R. Hayhurst, M.D., and Leonard Greenburg, Ph.D.</i> . . . . .	1024
Occupational Skin Diseases from the Biological Point of View. What Protects the Skin Against Light? Natural Gas. Studies in Natural Illumination in Schoolrooms. Heating and Ventilating in Schools and Factories. Occupational Cancers. Poison Alcohol. Epidemic of Dermatitis Venenata Due to a Hitherto Undescribed Cause. Industrial Medicine. A German Film on Atmospheric Hygiene. Compensation Act to be Extended to Asbestosis. Industrial Diseases and Compensation. Occupation and Health.	
Food, Drugs and Nutrition— <i>Walter S. Frisbie</i> . . . . .	1029
The Vitamin A. Content of the Liver of Normal Hogs and of Hogs Developing Experimental Rickets. A Paratyphoid-like Infection Due to Morgan's Bacillus. A Comparative Study of Members of the Lactobacillus Genus, with Special Emphasis on Lactobacilli of Soil and Grain. The Antiscorbutic Vitamin Content of Some Preserved Foods. Significance of Colon-Aerogenes Group in Ice Cream. Vitamin-C-Content of Commercially Canned Sauerkraut Together with Some Observations on Its Vitamin A Content. Nutritive Value of Corned Beef in Rats.	
Public Health Nursing— <i>Eva F. MacDougall, R.N.</i> . . . . .	1033
Results of Election at the Biennial Nurses' Convention in June. Pioneering in Public Health Nursing in Italy. Public Health Nursing Legislation.	

Continued on page viii

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Contents—Continued

	PAGE
Education and Publicity— <i>Evart G. Routzahn</i> . . . . .	1036
Old Dogs and New Tricks. The Laboratory Method. Publicity That Paid. The Newspaper Man Tells 'Em. Can Doctors Write? The Health Specialist. A Notable Exhibit. The Lecturer's Man Friday.	
Books and Reports . . . . .	1039
Handbook of Physical Education. Mental Hygiene. Fundamentals of Bacteriology. Incapacity or Disablement in Its Medical Aspects. Hygiene for Nurses. Rest-Pauses in Industry. Proceedings of the Seventh Annual Short School. Immunity in Infectious Diseases. Health, Public and Personal. Lehmann's Medical Hand Atlases. Stories of Health and Happiness. The Baby's First Two Years. Ergebnisse der gesamten Tuberkuloseforschung. Getting Well and Staying Well.	
Books Received . . . . .	1046
Health Department and Other Reports— <i>Ira V. Hiscock</i> . . . . .	1047
Rockford, Ill. Manchester, N. H. New Hampshire. Knoxville. New York Tuberculosis and Health Association. Pennsylvania Tuberculosis Association. Mount McGregor Sanatorium. Maryland. Miami County and Troy City, O. Jamaica. Indiana.	
A Selected Public Health Bibliography— <i>Raymond S. Patterson, Ph.D.</i> . .	1051
News from the Field . . . . .	1053
Conferences . . . . .	XXI

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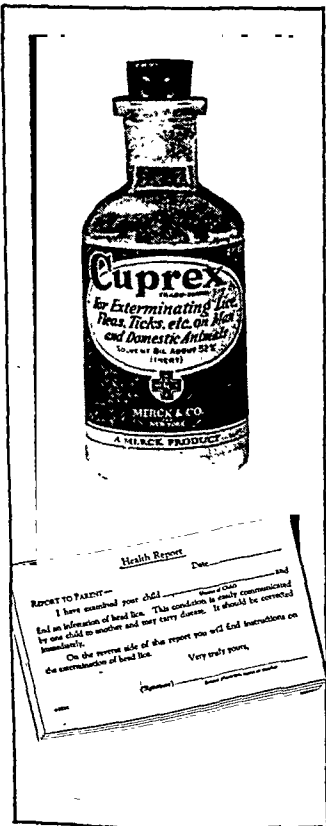
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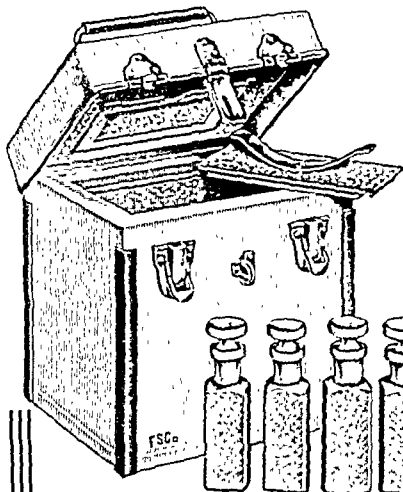
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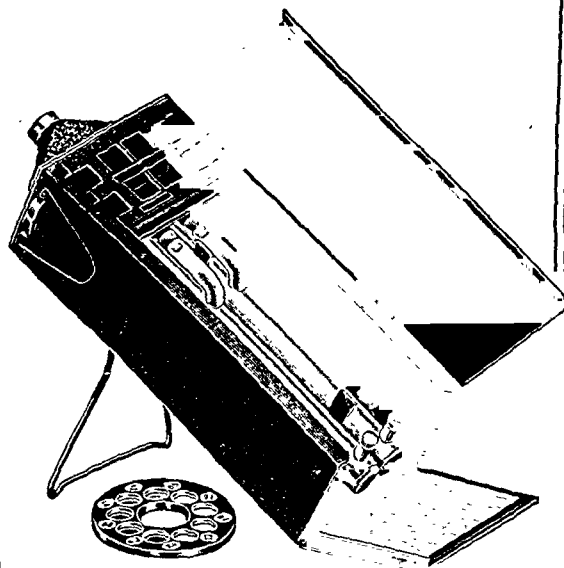
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Official Monthly Publication of the American Public Health Association

Volume XX

October, 1930

Number 10

---

## CONTENTS

	PAGE
The Training of Health Officers . . . . . <i>J. C. Geiger, M.D.</i>	1055
Home Pasteurization of Milk . . . . . <i>Lloyd Arnold, M.D., and C. J. Gustafson</i>	1065
Boulder Dam Symposium:	
The Sanitary Engineering Aspect . . . . . <i>Leon B. Reynolds</i>	1071
The Immigration Aspect . . . . . <i>Fred T. Foard, M.D.</i>	1080
Problems of Sanitation at Headquarters Area During Construction . . . . . <i>H. B. Hommon</i>	1086
Milk-Borne Disease in Massachusetts, 1927-1929 . . . . . <i>George H. Bigelow, M.D., and Filip C. Forsbeck, M.D.</i>	1094
An Effective and Practical Definition of Pasteurization . . . . . <i>Leslie C. Frank, C.E.</i>	1105
Discussion . . . . . <i>George W. Grim, V.M.D.</i>	1110

## EDITORIAL SECTION

Commercial Coöperation and Public Health . . . . .	1120
Glucose ("Corn Sugar," So-called) in Foods Undeclared on Labels . . . . .	1121

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Readers' Guide in your library.

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*Continued on page vi*





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	PAGE
The Lübeck Affair . . . . .	1122
The Epidemiology of Typhus . . . . .	1123
The Public Health Department in Mexico City . . . . .	1125
<i>F. P. Miranda, M.D.</i>	
Real Western Entertainment at Fort Worth Convention . . . . .	1128
<i>Dr. Truman Terrell</i>	
Air Travel and Public Health . . . . .	1129
<i>Frederick L. Hoffman, LL.D.</i>	

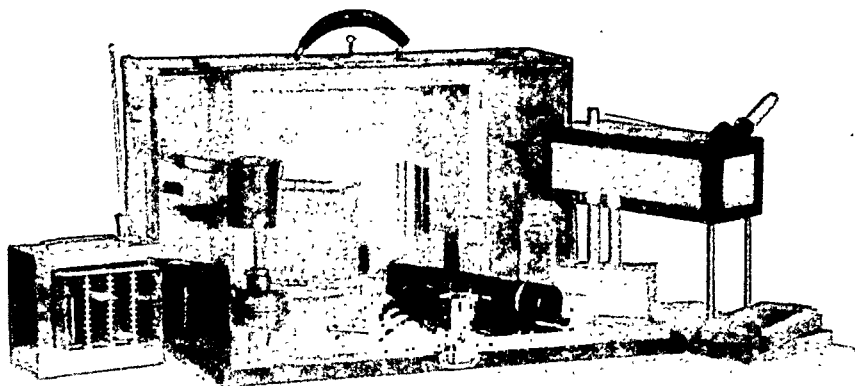
## ASSOCIATION NEWS

Organization of the American Public Health Association . . . . .	1131
Annual Meeting Information . . . . .	1133
Amendment to the Constitution . . . . .	1137
New Members . . . . .	1137
Application for Fellowship . . . . .	1138
Public Health Administration— <i>Henry F. Vaughan, D.P.H.</i> . . . . .	1139
Decrease of Hookworm. Influenza in Cleveland. Diphtheria Prevention in Philadelphia. Morbidity Area.	
Laboratory— <i>C. C. Young, D.P.H.</i> . . . . .	1140
A Simple Method for Indicating the Various Sugars Used in the Carbohydrate Series— <i>R. V. Stone, D.V.M.</i>	
A Storage Bin for Laboratory Glassware— <i>C. S. Mudge</i>	
Vital Statistics— <i>Louis I. Dublin, Ph.D.</i> . . . . .	1142
Appendicitis Mortality. Mortality Statistics, 1929. Public Health Conditions and Administration in Burma. Mortality Experience of the First Six Months of 1930.	
Public Health Engineering— <i>Arthur P. Miller, C.E.</i> . . . . .	1147
Progress Report of Pulaski, Va., Reservoir Studies— <i>F. J. Settle</i>	
Industrial Hygiene— <i>Emery R. Hayhurst, M.D., Ph.D., and Leonard Greenburg, M.D., Ph.D.</i> . . . . .	1150
The Mortality of Shopkeepers and Their Assistants. The Silicosis Bill. Night Work and Women's Health in Japan. The Best Light for Clerical Work. Progress Announcement: VI International Congress of Accidents and Industrial Medicine. Protection against Lead Poisoning in Germany. Health Regulations in Bolivia. Carcinogenicity of Oils. Lead Tetraethyl in Motor Spirit.	
Food, Drugs and Nutrition— <i>Walter S. Frisbie</i> . . . . .	1154
The Fat-Soluble Vitamin of Milk. Brucella Abortus in Certified Milk. The Calcification of the Lung in Healthy and Tuberculous Rabbits with Large Doses of Irradiated Ergosterol. Comparative Studies of the Influence of Acid-Forming and Base-Forming Diets on the Metabolism of Rats. On Possible Preparation of a Highly Active Ergosterol (Vitamin D) from Raw Coffee.	

Continued on page viii

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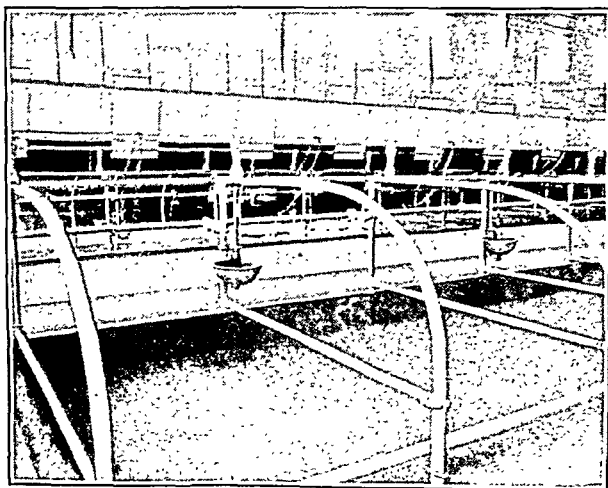
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*Contents—Continued*

	PAGE
Public Health Nursing— <i>Eva F. MacDougall, R.N.</i> . . . . .	1157
Who Is a Public Health Nurse? Supervision. For School Nurses.	
Education and Publicity— <i>Evart G. Routzahn</i> . . . . .	1159
An Attractive Annual Report. Quackery and the Spotlight. When Is an Exhibit? Precept Plus Example. A Health Text Book. Jazz Typography on the Skids. Good Ideas.	
Books and Reports . . . . .	1162
Harvey W. Wiley. Infant Nutrition. Die Statistischen Methoden. A Textbook of Hygiene. Essentials of Pediatric Nursing. Man vs. Microbes. A System of Bacteriology in Relation to Medicine. Military Preventive Medicine. Children at the Crossroads. Science in the Service of Health. History of Haitian Medicine. Personal Hygiene for Nurses. The Bureau of Home Economics—Its History, Activities and Organizations. Psychology for Executives. Hitch-Hikers.	
Books Received . . . . .	1170
A Selected Public Health Bibliography— <i>Raymond S. Patterson, Ph.D.</i> . .	1171
Health Department and Other Reports— <i>Ira V. Hiscock</i> . . . . .	1173
League of Red Cross Societies. Hygienic Institute. Johannesburg. Athens, and Clark County, Ga. New Britain, Conn. Elizabeth, N. J. Kent and Queen Anne's Counties, Md.	
News from the Field . . . . .	1176
Conferences . . . . .	XXV

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Volume XX

November, 1930

Number 11

---

### CONTENTS

	PAGE
The Incidence of " Jake " Paralysis in Oklahoma . . . . .	1179
<i>David T. Bowden, M.D., L. A. Turley, Ph.D., and H. A. Shoemaker</i>	
Sanitary Features of Irrigation . . . . .	1187
<i>Jane H. Rider, C.E.</i>	
The Control of Thermophilic Bacteria in Pasteurizing Plants . . . . .	1192
<i>M. W. Yale and Robert S. Breed, Ph.D.</i>	
Sickness Records in School Hygiene . . . . .	1199
<i>Jean Downes</i>	
A Peep into West Indian Medical History . . . . .	1207
<i>J. A. Ogilvie</i>	
A Bacteriological Study of Grade A Pasteurized Milk . . . . .	1209
<i>Cecil Brooks</i>	
Incubation of the Completed Kahn Test . . . . .	1216
<i>Nathan Nagle and John Lazarov</i>	
Mobile Milk Laboratories . . . . .	1219
<i>Thomas Parran, Jr., M.D.</i>	

### EDITORIAL SECTION

The Airplane and Yellow Fever . . . . .	1221
The American Health Officer and His European Brother . . . . .	1222
Vaccine and Vaccination . . . . .	1224

Contents of previous issues of the American Journal of Public Health and The Nation's Health can be found by consulting the Readers' Guide in your library.

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*Continued on page vi*



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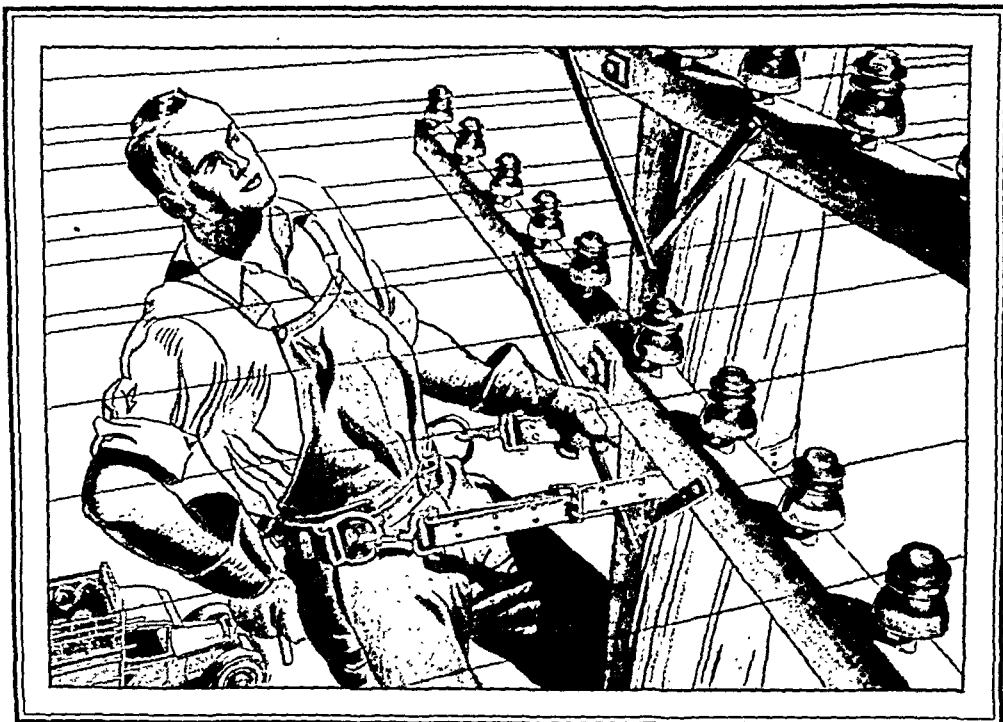
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	PAGE
ASSOCIATION NEWS	
New Members . . . . .	1225
Public Health Administration— <i>Henry F. Vaughan, D.P.H.</i> . . . . .	1228
Public Health Administration in Syracuse, N. Y. Typhoid Fever Spread by Lobster. Diphtheria Immunization in Detroit, Mich. Health Administration in Dayton, O. Whooping Cough. Health Examination in Newark, N. J. Chil- dren's Fund of Michigan. Meningitis in Detroit, Mich.	
Laboratory— <i>C. C. Young, D.P.H.</i> . . . . .	1231
A Sterile Dispensing Funnel— <i>G. D. Cummings</i> An Aid to More Accurate Colony Counting— <i>M. O. Robinson, V.M.D.</i>	
Vital Statistics— <i>Louis I. Dublin, Ph.D.</i> . . . . .	1233
Health Conditions in India. The Development of Maternity Work in China. Life and Death in Harlem. Cancer Record for 1929. Mortality Statistics: 1929.	
Public Health Engineering— <i>Arthur P. Miller, C.E.</i> . . . . .	1238
Mosquito Control on Water Supply Reservoirs. Some of the More Recent As- pects of Sewage Chlorination. Engines Run on Sewage Gas. The Treatment of Water and Waste Water with Chlorine and Copper and Chlorine and Silver. Pollution of Abandoned Well Causes Fond du Lac Typhoid Epidemic. Bac- terial Contamination of Baths. Treatment of Dairy Wastes. Water Supply and Sewerage of Large Japanese Cities. Flat Clarification Tanks with Sludge Scrap- ers. Chlorinated Drinking Water: The Use of Activated Charcoal Filters. The New Refuse Disposal Plant, Chapman Street.	
Industrial Hygiene— <i>Emery R. Hayhurst, M.D., and Leonard Greenburg,</i> <i>Ph.D.</i> . . . . .	1242
Pocket Reference of Information on Occupations. Anthracosis. Asbestosis Bod- ies in Sputum and Lung. The Occurrence of Pulmonary Fibrosis and Other Pul- monary Affections in Asbestos Workers. Health Service Policies. Studies in Illumination III. Occupation and Health.	
Food, Drugs and Nutrition— <i>Walter S. Frisbie</i> . . . . .	1245
The Williams-Waterman Vitamin B <sub>3</sub> . Vitamin G in Certain Meats and Meat By- Products. A Method of Purification of Carotene and the Vitamin Activity of Purified Carotene. Bacterial Spoilage of a Thousand Island Dressing. Nutri- tional Potency of Fresh Cooked, Dry and Alcohol-Extracted Liver. Vitamins in Canned Foods IX. Tomato Products.	
Public Health Nursing— <i>Eva F. MacDougall, R.N.</i> . . . . .	1248
Well Guided Experience is One of the Prime Requisites for Progress in the Public Health Nursing Profession. New School of Nursing at Vanderbilt University. The Nurse the Doctor Wants.	
Education and Publicity— <i>Evart G. Routzahn</i> . . . . .	1251
We Are Being Studied and Written Up. We Thank the Guest Editor. Syndi- cated Health Information. "Unfortunate Advertising." Diphtheria. Honorable Mention Radio. Motion Pictures. Diphtheria. Educational Material. New. Magazine Articles. Campaign-Days. Why Do They Do It? Reporting. Write Your Own Heading. Plays. Publicity Needed. Social Hygiene. Home-Made Posters.	





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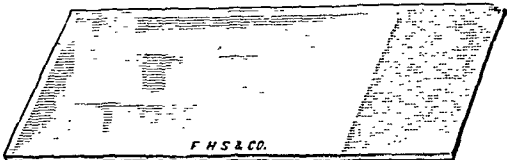
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Contents—Continued

	PAGE
Books and Reports . . . . .	1258
Tropical Medicine. Report on Fifth International Congress of Military Medicine and Pharmacy. Proceedings of the Twelfth Texas Water Works Short School. The Science of Biology. Stalkers of Pestilence. Common Colds. Ninth Annual Report of the Ohio Conference on Water Purification. Physiology and Biochemistry of Bacteria. Sleep—Why We Need It and How to Get It. The New Evolution, Zoogenesis. The Principles and Practice of Hygiene. Pioneers of Public Health. Elementary Materia Medica. The Human Factor in Industry. The Bacteriophage and Its Clinical Applications. Pettibones Physiological Chemistry.	
Health Department and Other Reports—Ira V. Hiscock . . . . .	1267
Syracuse, N. Y. Chelsea, Mass. Schenectady, N. Y. Worcester, Mass. Wood County, W. Va. Marion County, Ore.	
Books Received . . . . .	1269
A Selected Public Health Bibliography—Raymond S. Patterson, Ph.D. . . . .	1270
News from the Field . . . . .	1272
Conferences . . . . .	1273

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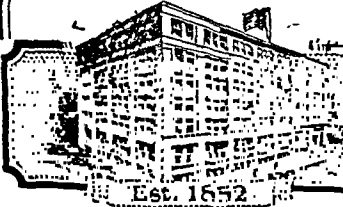
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Official Monthly Publication of the American Public Health Association

Volume XX                                      December, 1930                                      Number 12

### CONTENTS

	PAGE
Time, Cooperation and Research Measure Success in Health Work . . . . . <i>A. J. Chesley, M.D.</i>	1275
The Precise Evaluation of Light Therapy in Experimental Rickets . . . . . <i>John W. M. Bunker, Ph.D., and Robert S. Harris, S.B.</i>	1287
Evolving a Health Department . . . . . <i>Ennion G. Williams, M.D.</i>	1293
Incidence of Partial Paralysis . . . . . <i>E. L. Bishop, M.D., and H. C. Stewart, M.D.</i>	1307
Agglutination Tests for the Diagnosis of Undulant Fever . . . . . <i>S. Bayne-Jones, M.D.</i>	1313
The Industrial Nurse in Gear with the Machinery for Human Adjustment . . . . . <i>Violet H. Hodgson, R.N.</i>	1323
Annual Index . . . . .	Supplement

### EDITORIAL SECTION

The Fort Worth Meeting . . . . .	1328
Air Conditioning for Premature Infants . . . . .	1329
The Teeth and Diet . . . . .	1331

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Continued on page vi



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<i>Contents—Continued</i>	PAGE
ASSOCIATION NEWS	
Sixtieth Annual Meeting . . . . .	1333
Dr. Agramonte An Honorary Fellow . . . . .	1333
Post-Convention Tour of the A. P. H. A. to Mexico— <i>Emery R. Hayhurst, M.D., Ph.D., and Willimina M. Rayne</i> . . . . .	1334
New Members . . . . .	1339
Public Health Administration— <i>Henry F. Vaughan, D.P.H.</i> . . . . .	1343
Convalescent Serum Clinic— <i>Edgar E. Martmer, M.D.</i>	
Domestic Employees in Newark. Clinical Conferences on Communicable Diseases. Epidemic Jaundice.	
Laboratory— <i>C. C. Young, D.P.H.</i> . . . . .	1346
Manganese in River Water and Its Removal— <i>Perkins Boynton.</i>	
Vital Statistics— <i>Louis I. Dublin, Ph.D.</i> . . . . .	1347
Suicide Among Negroes in the United States. Marriage and Divorce, 1929. Air Travel Fatality Statistics. Mortality Statistics, 1929.	
Public Health Engineering— <i>Arthur P. Miller, C.E.</i> . . . . .	1352
Iron Hydroxide Prevents Mosquito Breeding. Two Years' Study and Practical Use of Crank Case Waste Oil as a Mosquito Larvicide. Deratization of Milan. Digestion of Activated Sludge. Chlorination of Water. Experimental Sewage Treatment Work in Europe. Can Tastes and Odors be Removed from Highly Polluted Waters? A Recent Development in Lime Water Softening. Water Service in Holland. Oil Exclusion and Removal.	
Industrial Hygiene— <i>Emery R. Hayhurst, M.D., Ph.D., and Leonard Greenburg, M.D., Ph.D.</i> . . . . .	1357
The Health of the Worker of Today. Cokemen and By-Product Workers—Their Complaints and Maladies. Outbursts of Carbon Dioxide in Mines. Glasses for Protecting the Eye from Glare. Annual Report of the South African Institute for Medical Research for 1929. Sulphur Dioxide in the Air at the Pittsburgh Experiment Station of the U. S. Bureau of Mines.	
Food, Drugs and Nutrition— <i>Walter S. Frisbie</i> . . . . .	1361
Effects of Ingestion of Tartrate or Sodium Aluminum Sulphate Baking Powder upon Growth, Reproduction and Kidney Structure in the Rat. Effects of the Habitual Use of Tartrate and Aluminum Baking Powders upon the Utilization of Food in the Rat. Vitamins in Dried Fruits, II. The Effect of Drying and of Sulphur Dioxide upon the Vitamin A Content of Fruits. Cystine Deficiency of the Proteins of Garden Peas and of Potatoes. Cereals and Mineral Metabolism. Tooth Growth in Experimental Scurvy.	
Public Health Nursing— <i>Eva F. MacDougall, R.N.</i> . . . . .	1365
A Nursing Program in a County Health Department. Westchester County Shows the Way. Public Health Nurses in a Diphtheria Campaign.	
Education and Publicity— <i>Evart G. Routzahn</i> . . . . .	1366
Exhibits at Fort Worth. People Who Can't or Won't Read. A Useful Source Book. Let's Start the Experiment Right. Getting Health Workers to Read About Health Work. How "Old" is the Reading Public? Peas, Potatoes, Pumpkins. Headquarters at Fort Worth. "Have You a Book?" When Editors Fear Their Readers. Tests and Checks on Health Education. The Challenge to the Publicity Worker. Health Books for the Public Library. An Effort to Check Results. Shop Talk and Working Tools. "Telling the Public." Try One of These? Magazine Articles. Language.	

*Continued on page viii*  
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# The Giant and the Pygmy



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**E**ITHER from your own personal experience or from observation you know how miserable one can feel when suffering from a cold. Of course you know some of the causes—chilling drafts, wet feet, over-fatigue, balky digestion, or an invading germ. You know it is harder to fight a cold when you are run-down. Keep yourself fit.

For the sake of your own personal comfort you want to get rid of a cold in the shortest possible time. For your own personal safety and that of your friends you ought to get rid of a cold in the shortest possible time.

There are many different kinds of colds—hard to distinguish one from the other. All of them are threats and one leads to another.

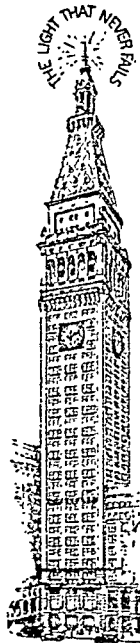
The original cold, if not promptly cured, breaks down resistance and is sometimes followed by a second cold more stubborn and oftentimes more treacherous than the first. The mucous membrane of the nose and throat is so weakened by Cold

No. 1 that the way is opened for dangerous germs to enter.

Cold No. 1 is the Pygmy that crawls through the keyhole and unlocks the door for Cold No. 2, the Giant. In fact, to carry the picture further, the Pygmy Cold, which may be nothing worse than snuffles, a slight cough, a bit of an ache or a pain, may be followed by any one of several Giant Colds—influenza, pneumonia or tuberculosis.

Take no chances the next time that symptoms of catching a cold are shown by you or someone in your family. Consult your doctor and dispose of the Pygmy quickly, before he can open the door for the Giant. At such a time a skilful doctor is your best ally and you will be wise in following faithfully his orders.

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Contents—Continued

	PAGE
Books and Reports . . . . .	1372
The First Year of Life. Industrial Hygiene for Schools. Dictionary of Biological Equivalents—German-English. Artificial Sunlight—Combining Radiation for Health with Light for Vision. Trauma, Disease, Compensation—A Handbook of Their Medico-Legal Relations. A Practical Medical Dictionary. Tobacco. Science in the Kitchen. Introduction to Mental Hygiene. Tuberculosis Among Children. Report on Methods of Analyzing Butter. The Measurement and Control of Municipal Sanitation. Practical Application of Heredity. Study Guide Text-book in the Principles and Practice of Nursing. Introduction to Human Parasitology. Is It Safe to Work?	
Health Department and Other Reports—Ira V. Hiscock . . . . .	1380
Measuring Municipal Sanitation. Pittsburgh County, Okla. Wood County, W. Va. Quincy, Mass. Newton, Mass. Hartford, Conn. Springfield, Mass. Los Angeles County. Connecticut. White Plains, N. Y. East Orange, N. J.	
Books Received . . . . .	1384
A Selected Public Health Bibliography—Raymond S. Patterson, Ph.D. . .	1385
News from the Field : . . . .	1387
Conferences . . . . .	xxi

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# American Journal of Public Health

## and THE NATION'S HEALTH Vol. XII No. 1

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Volume XX

January, 1930

Number 1

### A Study of Cultures of *Monilia* Isolated from Sputum\*

RUTH GILBERT, M. D., F. A. P. H. A., AND WILLIAM  
M. GROESBECK

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ALTHOUGH species of yeast-like organisms were associated with thrush as early as 1839, the relation of fungi to human disease has been given far less attention than similar phases of bacteriology. The wider interest in pathogenic bacteria has probably been aroused by their greater frequency as incitants of systemic disease. In temperate climates, few of the serious diseases of man or other animals have been shown to be due to fungi. Nevertheless, the high mortality of the systemic form of blastomycosis and the similar type of infection known as coccidoidal granuloma, occurring in the San Joaquin Valley in California, illustrates the marked pathogenicity of certain species of these organisms for man. Among plants, many of the most destructive diseases are due to fungi. The economic importance of the numerous blights, smuts, and rusts is too well known to need emphasis.

Castellani's<sup>1</sup> extensive investigation of mycotic infections in man, particularly in the tropics, has demonstrated their wide distribution, the variety of lesions induced, and the number of species involved.

The recent attention paid to mycoses of the skin, especially of the feet, which have been found in such a large percentage of college students and others using the shower baths in clubs or gymnasiums, has stimulated interest in mycotic infections in general. The relative frequency, in Wisconsin, of pulmonary lesions due to *monilia* as shown

\* Read before the Laboratory Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 2, 1929.

by the work of Stovall<sup>2</sup> raises the question of whether infections of this nature may not be more disseminated in other parts of the country than statistics indicate.

Of the large number of specimens of sputum received at our laboratory, extremely few are accompanied by requests for an examination for fungi. Most of those containing these organisms have first come to our attention in the course of the routine examinations for tubercle bacilli, and cultures are occasionally submitted for identification from other laboratories.

Strains of monilia pathogenic for white rats have been isolated from the sputum of 11 patients. The clinical histories of 2 are especially interesting. The first was a woman 51 years of age who had been acutely ill for about 6 weeks. Tuberculosis was suspected. The symptoms recorded were considerable coughing; a large amount of thick, mucilaginous sputum, almost constantly blood-streaked; very little fever; severe pain in the lower chest; some dullness; a few rales; and at times delirium. In a series of sputum specimens examined in a local laboratory, no tubercle bacilli were found, but a culture of monilia was isolated. This culture and additional specimens from the patient were sent to us for further study. A few acid-fast bacilli were seen in one stained preparation made from the sputum, but no others could be found in any of the specimens, even upon repeated examination. The patient finally began to improve, and about a year later seemed in perfect health.

The second was a man of 66 who had been superintendent in a burlap bag factory where he was exposed to dust from the cleaning of coarse fiber used in weaving. For several years he had had symptoms resembling those of tuberculosis. He had visited various sanatoriums and, although a large number of sputum specimens were examined, no tubercle bacilli were found. In one sanatorium, a diagnosis of sporotrichosis was said to have been made, based on the finding of the organism in the sputum.

At the time the first specimen of sputum was sent to our laboratory, the patient had been acutely ill for about 6 months, a lung abscess and empyema having developed. Following a series of severe hemorrhages, a rib resection was made and the abscess drained. After this treatment no more hemorrhages occurred, but profuse drainage and considerable coughing continued. The general condition of the patient deteriorated until he died 19 months later. An autopsy was not secured. Cultures of monilia were isolated from 3 of the 6 specimens of sputum submitted at intervals during a period of 11 months. No acid-fast bacilli were found in any of them, but a guinea pig

inoculated with one of the specimens from which monilia were isolated developed generalized tuberculosis.

The information concerning the clinical manifestations in the other cases is more limited. The data available may be summarized as follows:

A man of 32 with a clinical diagnosis of pulmonary tuberculosis.

A boy of 17 who had had an appendectomy 3 months prior to the development of a pulmonary abscess at the base of the right lung; coughing, expectoration, and pain were said to be the predominating symptoms.

A man 72 years of age with a cough and a slight rise in temperature.

A woman of 60 with chronic bronchitis, laryngitis, and pharyngitis, and a considerable amount of frothy mucous sputum; she had a history of cholecystitis of over 2 years' duration. Four months before the receipt of the first of two specimens from which monilia were isolated, the patient was acutely ill with pneumonia followed by pleurisy and jaundice, and type-II pneumococci were isolated from a specimen at that time.

A farmer 34 years of age having acute pleurisy with effusion.

A laborer-mechanic of 35 having had chronic bronchitis, rheumatism, and chronic myocarditis for 10 years following war service.

A woman of 28 with bronchitis of a few weeks' duration.

A woman mill worker visited a clinic for a chest examination; the attending physician found no evidence of tuberculosis, but requested the examination of a series of sputum specimens.

A man of 40 concerning whom no history has been obtained.

Monilia pathogenic for rats have been isolated also from the exudate from 2 cases of thrush and from 1 of vaginitis; and from the feces of a patient with a history of diarrhea of 8 months' duration and recovery following treatment with bismuth and potassium iodide.

In morphology, the monilia studied resemble yeasts (see Figures I and II). The cells are elliptical and reproduce by budding, while short hyphae are often noted. No ascospore formation can be demonstrated.

The cultures grow readily on the usual laboratory mediums. On agar, the growth is thick and creamy with a tendency to coalesce. Gelatin is not liquefied. The fermentative reaction with different carbohydrates has been found to vary. All of the strains studied ferment dextrose and most of them also saccharose and maltose. Dextrose broth has been found to contain ethyl alcohol after representative cultures have grown in it for 4 days.

All of the cultures have proved pathogenic for rats, and those tested have been found pathogenic for rabbits also. By intravenous inoculation, one-twentieth, or sometimes less, of the 24-hour growth on an agar slant is usually fatal for white rats and small rabbits in from 1 to 5 days. Adult rabbits may survive a single inoculation, but



FIGURES I AND II—A 24-hour culture of monilia on dextrose agar. Stained with dilute carbol fuchsin.  $\times 710$  diameters.

are killed by repeated doses. If white rats live for from 3 to 5 days following an intravenous inoculation, the lesions in the kidneys are characteristic. The surface of the organ is profusely dotted with raised yellowish white areas about 1 mm. in diameter. Sections of the organ (see Figures III to X) show a severe, extensive

nephritis. The cortex is almost entirely destroyed, only a few islands of convoluted tubules of relatively normal appearance remaining. The majority have undergone granular degeneration with hemorrhage and mononuclear cell infiltration. The glomeruli are extensively involved, some showing precipitated albuminous material in the glomerular spaces, others extensive hemorrhage or hyaline necrosis. The medulla is hyperemic and edematous, but the large masses of necrosis found in the cortex are absent. When Gram-Weigert stain is used, numerous colony-like masses of fungi are found throughout the kidney, but particularly in the cortex. The cellular elements appear as globules, varying in size from approximately  $1\mu$  to  $12\mu$ , and varying from light violet to intensely stained forms, with small and large intracellular granules. Numerous short mycelial filaments, some of them about  $30\mu$  in length are seen.

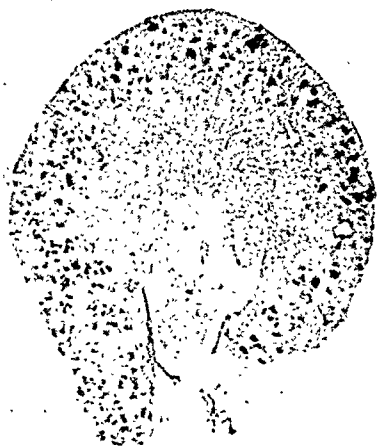


FIGURE III—Section of kidney of rat (M. 3980) dying 3 days after intravenous inoculation with monilia. Stained by Gram-Weigert method.  $\times 5$  diameters.

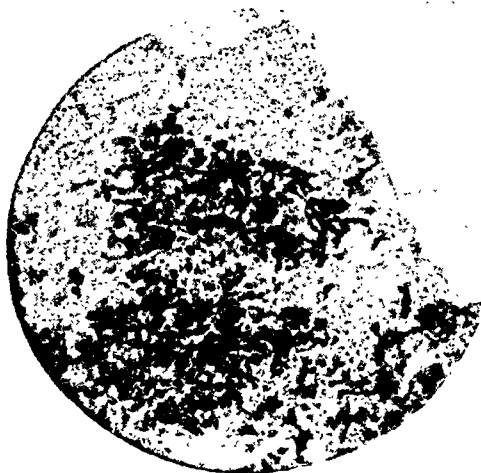
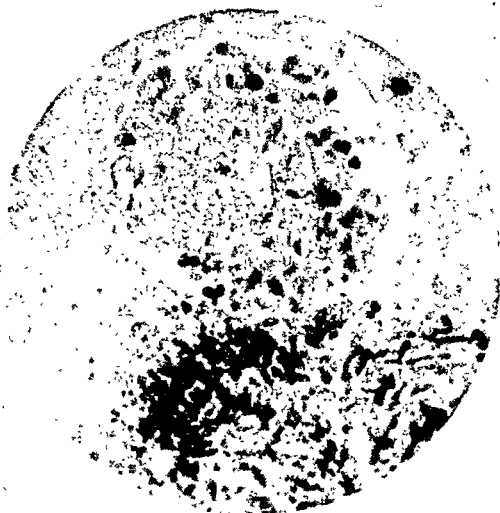
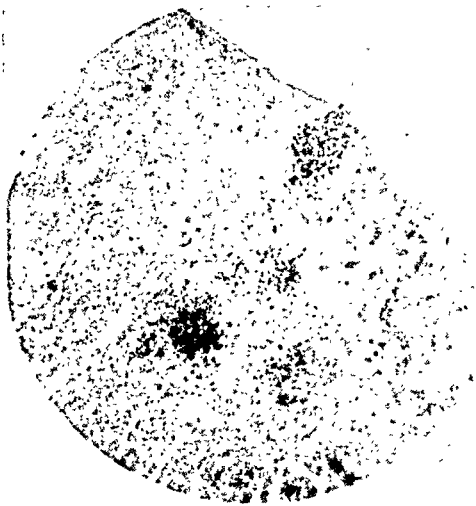


FIGURE IV—Section of kidney of rat (M. 3980) dying 3 days after inoculation with monilia. Eosin methylene blue stain.  $\times 290$  diameters.



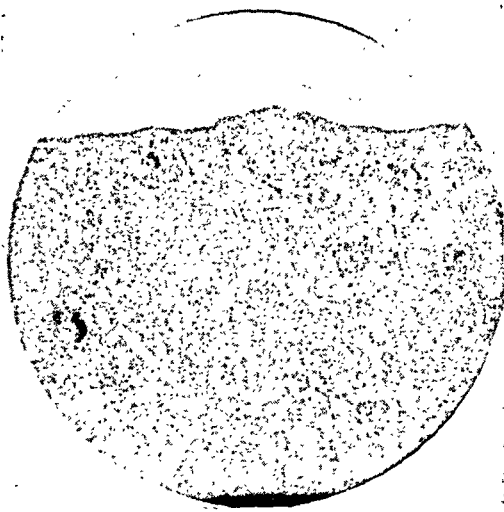
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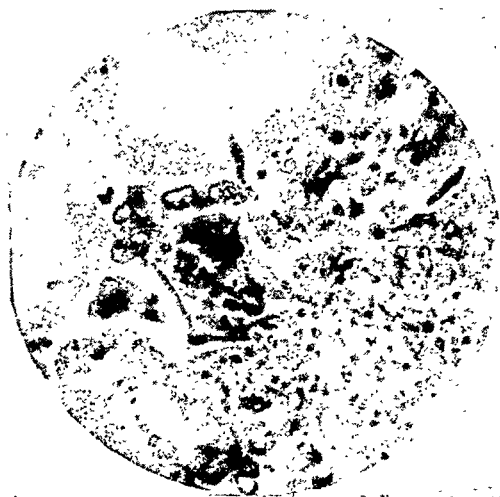
VII



VIII



IX



X

FIGURE V—Section of kidney of rat (M. 3980) dying 3 days after inoculation with monilia. Eosin methylene blue stain.  $\times 390$  diameters.

FIGURE VI—Eosin methylene blue stain.  $\times 70$  diameters.

FIGURE VII—Stained by Gram-Weigert method.  $\times 100$  diameters.

FIGURE VIII—Section of kidney of rat (M. 3980) dying 3 days after inoculation with monilia. Eosin methylene blue stain.  $\times 70$  diameters.

FIGURE IX—Eosin methylene blue stain.  $\times 70$  diameters.

FIGURE X—Eosin methylene blue stain.  $\times 840$  diameters.

In the myocardium and liver, numerous focuses of necrosis with slight hemorrhage and mononuclear cell infiltration are found. Evidence of encephalitis with perivascular mononuclear infiltration, and an occasional necrotic area resembling those in the other organs mentioned may be noted in the brain. Sections of the lung show congestion and edema with numerous polymorphonuclear leucocytes in the alveolar exudate, presenting a picture of early pneumonia. Usually, cultures of the organisms can be readily isolated from these organs or from the heart's blood.

Since some of the lesions appeared to have originated in minute infarcts and since the monilia cells are much larger than most bacteria, it seemed desirable to determine whether the injuries to the tissue had been primarily due to mechanical plugging of the capillaries. Animals were therefore inoculated intravenously with cultures of baker's yeast, *Saccharomyces cerevisiae*, which has cells about the same size as those of monilia, or perhaps a little larger. Culturally and morphologically, yeasts resemble monilia, except that ascospore formations can be demonstrated. White rats, guinea pigs, and rabbits receiving intravenous inoculations of massive doses seemed uninjured.

Proof was not obtained that the strains of monilia isolated from the sputum were incitants of pulmonary lesions in the patients from whose specimens they were obtained. Probably, in some cases at least, they were secondary invaders. Judging from the behavior of the similar, if not identical, organisms found in thrush, the vitality of the individual may need to be markedly lowered before infection occurs. It is possible also that some of the pathogenic species of monilia in the sputum specimens may have been derived from unobserved lesions of thrush in the mouth, throat, or bronchi.

The finding, in large numbers, of organisms capable of inducing such characteristic lesions in laboratory animals in only a small percentage of sputum specimens examined, and the fact that the specimens containing them have, in most cases, come from patients presenting some evidence of pulmonary disease would seem to warrant an investigation of the etiological relation of the organisms to any disease process that may be present. Such a study can of course be successfully made only in laboratories where there is opportunity for repeated observation of the patient, and for a post-mortem examination.

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# Standards for Public Bathing Beaches and Wading Pools\*

BEFORE proceeding with the discussion of the two topics assigned to us for special consideration at the 1928 meetings of the Conference of State Sanitary Engineers, and of the Public Health Engineering Section, your committee wishes to call attention to the need for special precautions to prevent the spread of infectious skin diseases of the feet at swimming pools and other public bathing places.

## FOOT DISEASES

Although such diseases are not reportable, and their prevalence is not a matter of official record, unofficial reports of the occurrence of ring worm, toe itch, toe scald, fungus foot, papilloma, and similar infections at pools and beaches in various parts of the country are becoming more and more frequent.

Most, if not all, of these foot diseases are caused by a fungus which is spread by infection of the floors of dressing rooms, etc., at pools, bath houses, gymnasiums, and other places where persons go barefoot. While control methods have not been completely worked out, the following preventive measures will prove useful in checking the spread of these diseases:

1. The feet, and especially the toes, of all bathers should be inspected regularly, and those persons showing infection should be excluded from the pool and dressing rooms and advised to consult a skin specialist. The disease may show around the base of the nails or between the toes as raw open sores—the sodden type; as small or large blisters—the vesicular type; or it may resemble eczema. The type which the disease exhibits may change from time to time in the same patient, depending on circumstances.

2. Wash all floors, benches, and stools in dressing rooms, diving boards, out-of-water portions of ladders or steps, rubber mats, etc., daily with a strong solution of chlorinated lime or chlorinated soda. It is known that the fungus will grow readily on silk and cotton goods and on leather, and it is believed that it will also grow on damp wood;

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\* Report of the Joint Committee on Bathing Places of the A. P. H. A. and the Conference of State Sanitary Engineers, presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 1, 1929.



so special attention should be paid to disinfection of any woodwork with which the feet of bathers may come in contact. Canvas mats or pads should be abolished.

3. Take precautions to insure that there is no exchange of unsterilized towels, suits, bathing slippers, etc., among bathers. All suits and towels should be thoroughly sterilized by boiling before being dried for reissue, as recommended in the last report of this committee.

#### BATHING BEACHES

The committee would again call attention to the sanitary requirements for public bathing beaches recommended in paragraphs II, III, XII, XIII, XIV, XIX, XX, and XXI of its report for 1926,\* entitled "Standards for the Design, Construction, Equipment, and Operation of Swimming Pools and other Bathing Places."

As stated in paragraph III, A, the committee is of the opinion that "It is very desirable that the bathing waters at public bathing places on natural streams, lakes, and tidal waters should be of the same standard of bacterial quality as is required for swimming pools." It is recognized, however, that the strict application of swimming pool water standards to all public bathing waters would probably not be practicable at present. Furthermore, since there is not now available any sufficient volume of data as to the quality of waters now used for bathing, nor any sufficient record of the causation of disease by bathing in moderately polluted waters, your committee feels that any definite standard of bacterial quality which it might propose would be purely empirical.

In the case of swimming pools it was entirely fair to set up a high standard of bacterial quality, since effective methods were available by which such quality could be maintained at a reasonable cost. The bathing beach problem is distinctly different. In certain instances it may be feasible to treat the water at the beach satisfactorily with chlorine or other disinfectant. In the majority of instances, however, to set up and attempt to enforce a high standard of bacterial quality would mean that we would be forced either to condemn many waters now used for bathing, or to attempt to reduce the pollution by elimination of the sources or by treatment of sewage discharged therein. As in many cases there has been a considerable capital investment at these beaches, not only in bath houses and bathing equipment, but also in amusement facilities, any attempt at condemnation, except following an epidemic traceable to the pollution of the waters, would meet with strong opposition both from the public, who have been accustomed to

\* *A. J. P. H.*, XVI, 12: 1186 (Dec.), 1926. For 1927 Report, see *A. J. P. H.*, XVIII, 2: 194 (Feb.), 1928.

bathe regularly at these beaches, and from persons whose investment would be wiped out by their closing. On the other hand, the reduction of pollution usually means a large expense for sewage treatment and considerable delay while such treatment works can be planned, financed, and constructed.

It would seem to your committee, therefore, that while it is entirely legitimate to use pollution of bathing beaches as an argument in a program for a clean-up of public waters, the bathing beach problem is one which should properly be worked out by local and state authorities for the best interests of all parties concerned in each particular locality, unhampered by any empirical standards.

In a swimming pool the major danger to health of bathers comes from fresh secretions introduced into the water by other bathers. At a public bathing beach where a large volume of water is available for dilution, the danger of infection by such personal discharges is very much reduced, and the major health hazard becomes that of pollution of the water by sewage. The potential danger to health from bathing in water at any particular beach can only be determined by a complete survey, in which dilution of the polluting sewage, and the effect of tides, winds, and other factors in producing currents, are given full weight in the interpretation of the results of bacterial and chemical analyses of the water. In such an interpretation it must ever be borne in mind that the time-travel-distance factor of polluting waters is of paramount importance from a public health viewpoint. Direct pollution by fresh sewage from nearby sources, even though relatively small in amount, is potentially more dangerous than pollution by a much greater volume of sewage some distance away. It should also be recognized that a bather is much less likely to take into his mouth and swallow salt water than fresh, and for this reason the same degree of pollution may be potentially less dangerous at the sea-shore than at a bathing place on an inland stream or lake.

#### WADING POOLS

With increasing attention paid to the sanitation of swimming pools throughout the country, the attention of many sanitary authorities is being attracted to the need for improvement in the sanitation of the numerous shallow wading pools which have been installed for use of children in public parks and playgrounds. Early in the summer, your committee sent out a questionnaire asking the opinion of the various state sanitary engineers as to the advisability of attempting to control the sanitation of these pools, and as to what standards of water quality, cleanliness, etc., it would be practical to establish. Replies

have been received from only 12 states, an insufficient number to enable your committee to determine the consensus of opinion of the health authorities of the states on these questions, and make any definite recommendations. The replies already received, however, indicate that:

1. It is both desirable and practicable to establish a system of supervision over sanitation of public wading pools similar to that now exercised by public health authorities over swimming pools.

2. It appears inadvisable at present to require the same standards of water quality for very shallow pools used for wading only as are required for swimming pools.

3. For administrative purposes a distinction on a basis of maximum depth of water should be established between swimming pools and wading pools.

STEPHEN DEM. GAGE, *Chairman*

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## Men's Clothing

DR. BORLAND says: Take the question of cleanliness. The average woman wears light fabrics, which quickly show the dirt, but are easily and frequently cleaned. Have you ever considered how long a man's suit goes without being *thoroughly cleaned*? Men's clothes actually come into contact with and absorb more dirt than women's; but it does not show so much because of the darker color of the cloth. *The dirt is there all the same, although not seen*, and where there is dirt you will find germs. Consider hygiene in a broader sense. The many layers and heavy, thick material of men's garments make them thoroughly unsatisfactory from a health point of view. What chance has sunlight or fresh air of gaining access to the body? The perspiration, instead of evaporating freely with an inappreciable odor, is retained by the inner and outer layers of clothing. They become clammy and clammy, giving off an unpleasant and unhygienic odor. These damp, clammy clothes are also responsible for many of the so-called summer colds. What are the remedies? Changes can only come about by desire, thought and action. Men should realize their conservatism in dress and the need for more progressive ideas.—Dr. Vynne Borland, quoted in *Med. Off.*, Sept. 21, 1929, p. 135.

# Need for Cancer Morbidity Statistics\*

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TO a great extent the only available large scale statistics on cancer are those based on death certificates. These possess, as everyone knows, certain uncorrectable errors due to lack of accuracy in the primary documents. Such cancer death records, even with all possible corrections, are of but little value in the practical evaluation of the results of treatment, or lack of treatment, for any given individual with cancer; nor will any possible increase in accuracy of ordinary death records as at present made furnish such information.

The reports of the U. S. Bureau of the Census can rise no higher than the source of information, which is a death certificate. That these records may err by some 30 to 40 per cent may seem astonishing to statisticians, but not to pathologists. Full information on the matter has been in print for years, and Wells has recently again called attention to it. The only method of obtaining correct statistics is the basing of all diagnoses on autopsies. With the present attitude of a large proportion of the population, this is obviously impossible, and unfortunately even in so advanced a country as Switzerland which, as Hoffman has pointed out, has reached in all probability an approximate maximum rate for cancer in a white population, that is, some 125 to 130 per 100,000, there has been a recent check placed on autopsies. Unquestionably therefore the Swiss cancer rate will fall in the future.

These facts are also reflected in the great differences which exist between the cancer death rates in the larger cities with high grade hospitals, and those of the rural districts. The differences are just as striking as are the differences in the cancer rate of, say, Denmark and Switzerland and that of the United States.

As I have said, the statistical analysis of deaths cannot rise higher than the accuracy of the certification by the physician; so the country's cancer death rate is a reflection of the diagnostic accuracy, or rather inaccuracy, employed in making such reports. To the layman it may seem strange that a patient can die with cancer and yet have

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\* Read before the Vital Statistics Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 1, 1929.

no symptoms of the disease; yet every pathologist knows that this is not only possible, but not infrequent. For example, in the last two years I have seen 6 such patients autopsied in which no possible diagnosis of cancer could have been made before death. In one of these, two expert surgeons examined the patient with the greatest care and stated definitely that certain symptoms and suspicious bone changes could not be due to carcinoma of the prostate. Nevertheless, at autopsy the only carcinoma which was found was in the prostate and in the bones. The type in the bones was that of a prostatic carcinoma.

Another similar case without the bone changes entirely escaped diagnosis for that reason and was only shown to have carcinoma of the prostate at autopsy. While small tumors like these are not always the immediate cause of death, they may impede the flow of urine, inducing back-pressure on the kidneys with damage of their function, and either death from uremic disturbances or secondary infection.

Of two other illustrative cases there was one in which several operations were done to relieve adhesions between the intestines. The patient finally died of intestinal obstruction and a carcinoma of the ileocecal portion of the intestine was found. It was a diffuse growth and could not possibly have been felt by the surgeon who did the operations. It had no immediate connection with the cause of death, but unquestionably the patient's symptoms were due to this growth, and she would not have died unless the growth had been present.

In another instance a case of carcinoma of the stomach was not correctly diagnosed during life, though the patient was under observation for a number of months and every diagnostic facility used which a large metropolitan hospital could offer. In two other cases wholly unsuspected metastatic melanomata were found only at autopsy in the viscera. In one the history recorded the fact that a mole had been burned out of the skin of the back with radium four years before. In a second a small perforating ulcer of the foot was observed clinically but there was no evidence that this was of a malignant nature; yet at autopsy melanotic tumors were found in the heart muscle and elsewhere. Evidently tumor particles from a small plantar melanoma had been massaged into the circulation by the patient walking on the foot.

These 6 recent examples occurring in the course of only about 200 autopsies illustrate clearly enough the absolute impossibility of diagnosing a certain proportion of instances of cancer without autopsy. Unquestionably a large number of patients die with cerebral, pulmonary and abdominal carcinosis in which no diagnosis of the disease is made.

The constantly increasing crude rate in the United States is admirable evidence that the ability to cure the individual patient is so small that it makes no impression on the general trend of the disease, but when it is realized that only one-fifth of the cancer cases in a large city that apply to a general hospital are in a sufficiently early stage to warrant operation for the cure of the disease, it will be immediately realized that it is not surprising that the best modern treatment has had no effect on the disease. As a matter of fact, to say that 20 per cent of the patients who enter a hospital are operable is certainly a very optimistic exaggeration of the conditions applying all over the country.

In rural districts practically no cases come in time for curative treatment. This situation is due in part to the extreme difficulty of the diagnosis of the disease already referred to, in part to the gross ignorance of the patient, and in part to the lack of modern training of a considerable proportion of the medical profession. Again, the activities of quacks, mental healers and others who criticise the methods used by the medical profession to treat cancer, play a part; and often such irregular healers urge patients to follow a course quite different from that advised by the physician whom the individual may have consulted.

At present the tendency is not to speak of the cure of cancer, but rather of its arrest. The reason for this change in phrase is the fact that a careful study of large series of treated patients shows that late recurrences may take place 8 and 10 years after an operation; and that a person who has once had a cancer is by no means prevented from having a second, and possibly is more likely to have a second. Hence the tendency is to consider operative or other treatment as palliative rather than curative.

In order to estimate the palliative value of any type of treatment, the expectation of life of the untreated case must be known with some accuracy. This is not a simple arithmetic average of the survival period. That assumes that the term of existence of that sample of the population having cancer follows a strictly Gaussian probability curve, whereas in fact the curve is probably highly skewed in man as it is in animals bearing tumors. Figure I shows this. Hence some effort should be made to determine the mode in addition to the simple arithmetic mean.

In order that such data may be practically useful, age groupings are essential, and what is still more important is some information as to the site of the growth, its size when discovered, and its gross and microscopic characteristics. Without this information any prognosis

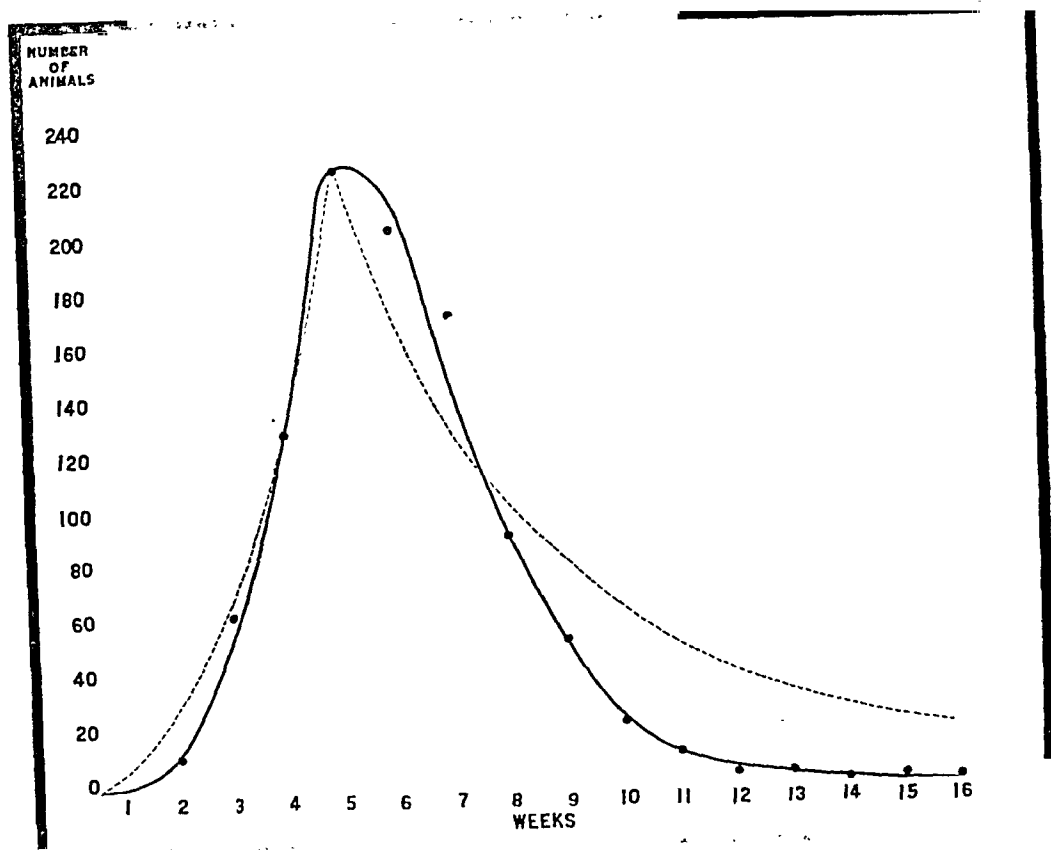


FIGURE I—The curve shows the time of occurrence of death in 1,000 rats of the same strain inoculated with the Flexner rat carcinoma (FRC). The time intervals are weeks. The average survival period is obviously 8 weeks. The mode is 5 weeks. The weighted mean taken by multiplying the number of deaths in each group by the weeks practically corresponds with the mode in this tumor, but this is an accidental agreement as in other tumors the weighted mean differs from the mode. The dotted curve represents the deaths of *Drosophila* eggs after exposure to X-ray. It is merely included to show that curves similar to the tumor death curves are obtained by the action of another lethal agent on another biological material. The coördinates in this case should be the percentage of the survivals and amounts of X-ray.

as to the results of treatment of any type of tumor is impossible. As an example, selecting a site where tumors are external and should be diagnosed easily and early, it has been found that some tumors of the female breast, though very small, are very frequently fatal. These are the small celled tumors in fat women, especially when the tumor is in the mesial aspect of the breast. The tumor is not noticed early because of the bulk of the fat which surrounds it. It metastasizes rapidly because of the small size of its cells, and the path which these cells follow is directly back into the thorax, thus involving the mediastinum and the lung at a very early date. Such metastases are not removable by surgery nor curable by X-ray or radium.

On the other hand, the rapidly growing, morphologically highly malignant tumor in a thin woman in the outer half of the breast, composed of large cells, or of cells which make mucus, will be diagnosed so easily that there will either not be any metastases along the lymph channels into the lymph nodes of the axilla or, if such an occurrence does take place, the large cells will be caught in the lymph nodes and held there for a period. These patients are the favorable type and form the majority of those who survive their operative treatment over long periods. Every surgeon has such cases living ten, fifteen and twenty years after operation.

That the mechanics of the situation are important is evident from the fact that the mucoid cancers of the breast, which form sticky masses from which the cells escape with great difficulty, give a very high percentage of permanent cures. Unfortunately this type occurs in the breast only in about 1 per cent of the total cancers of this region.

If this Association is to do anything to improve this sorry situation which now exists in the treatment of cancer, it should stand squarely behind making cancer a notifiable disease. If this could be done, the situation would be benefitted in a variety of ways.

The making of diseases notifiable has hitherto been to protect the community from such individuals as have infectious diseases. Such reason does not apply to cancer. The importance of making this disease notifiable is to protect the individual from a purely personal and, unless promptly treated, inevitably fatal condition.

Physicians on the whole are rather fed up with the general statement of propagandists that 1 woman in 5 and 1 man in 8 of those dying between the ages of 45 and 65 will pass on from cancer. They are only mildly interested in the fact that cancer is now second to heart disease in the list of causes of death. What they do want to know as quickly as possible is what to say to the individual who has a cancer. For example, does any form of treatment really prolong life? We can answer this in a positive way. For those who come with cancer in an exceedingly early stage, surgery, radium and X-ray have unquestionably prolonged the lives of many for many years, so long in fact that it is proper to speak of a "cure." But at least 80 per cent of those who consult a physician are entirely beyond cure. What shall be done?

Today we have no reliable evidence as to the natural duration of the disease in different sites, and of the different types which will permit a physician to make a definite statement. For example, in a case of cancer of the rectum, will a simple palliative operation give the



person more comfort and prolong his life for a longer period than will palliative treatment with X-ray or radium? It is generally held by surgeons that a colostomy relieves pain and enables a patient to live for a considerable time in much better condition than if no such operation is done, and it is possible to say to the patient that considerable statistical evidence exists for believing that the average patient with untreated cancer of the rectum lives only about 26 months. But how does he live when untreated? We know roughly that he generally lives in abject misery. The person with a colostomy is much more comfortable.

The patient as an individual is not interested in the average length of life but how long *he* is going to live. If he has a diffuse infiltrating small cell carcinoma of the rectum, will he live a shorter time than a patient with a colloid carcinoma? No facts, but only general impressions, are available. If he has a colloid carcinoma, should he avoid a dangerous and extensive operation and fall back upon X-ray and radium?—or had the risk of the operation better be disregarded, to take instead the chance of permanent arrest of the growth, in case its removal is possible, rather than to attempt palliation by radiation methods?

The physician is daily asked to decide whether a patient with a doubtfully operable cancer of the breast will live longer with operation plus post-operative radiation, or will do better to avoid operation and rely upon X-ray and radium palliation. It is evident that these questions can only be answered if we have carefully collected statistics of the length of life of untreated cases which have been observed under conditions which will record the type of tumor, the X-ray demonstration of possible metastases and other facts which determine more than the mere presence of the growth—the natural duration of life under the particular circumstances. Now is the time to get such figures. In a few years all patients will get some form of treatment.

I do not for one minute suggest that these criterions will be available in this generation, but if only one state could be induced to make a beginning, facts would shortly be collectable. A good illustration of the necessity of such figures can be drawn from a collection in an extensive and valuable paper by Janet Lane-Claypon.<sup>1</sup> The learned author states that "the study of late results in relation to the microscopical characters of the growths reveals no significant difference in the survival rates for growths of highly cellular type and those of scirrhus type." Yet undoubtedly there are differences. "The results of operation in cases of adenocarcinomata are more favorable than of either of the above form and those obtained with duct and

colloid cancer are decidedly better. The samples of these latter varieties are however very small."

These conclusions are based upon the study of nearly 2,000 cases of cancer of the breast with pathological reports. The difficulties, however, of accurately classifying the material, owing to the variability of the pathological reports and the clinical records, is acknowledged, and some of the samples are so small that studies of more cases will be necessary before definite results can be obtained. In other words, even in so laborious an investigation, backed by the authority of the English Government, conclusions are of necessity drawn in such general terms that they are of relatively little applicability to the individual patient. Yet daily the physician has to advise the afflicted patient.

There are, on the other hand, individual collections, mostly from hospital material, which cover certain points, among them length of life of treated or untreated cases, etc.; but of course it is well known that a hospital population does not represent an accurate sample of a disease occurring in the population as a whole. The number of patients studied in such special collections is small and the results are presented chiefly as arithmetic averages. None of the statistical collections with which I am familiar have sufficient material to permit of satisfactory age groupings; in practically none of this material are histological reports available, and therefore they, as well as the mortality statistics, are wholly valueless in forming a judgment as to the care of the individual case.

Dublin has approached the problem in a paper read at the Mohonk Conference<sup>2</sup> by preparing life tables of cancer from the registration area figures for 1910, 1922 and 1924. But such tables have the inherent errors mentioned above and treat the disease as an entity without reference to organs or types. Such material is useful for propaganda purposes to dramatize the situation, but lacks the specificity required to be of practical value.

The best analysis with which the writer is familiar is that of Professor Major Greenwood.<sup>3</sup> In his short paper the author discusses with great shrewdness the actuarial difficulties which render special collections no true sample of the population, the errors which underlie the alleged duration of untreated cases, and other fallacies which unavoidably creep into the primary records which furnish our only material for study. Supplementary evidence is available in a report by Sir George Buchanan for the League of Nations. (III. Health, 1927, III, 17.) There the mean duration of cancer of the breast and cervix of Italian women is shown to be very much smaller than for

English women, and the report cautiously suggests that there may be racial differences in growth rate. This may be a statistician's explanation; but the physician who sees a large amount of Italian material will rather believe that the ignorance and superstition so evident in the Italian peasantry may be reflected in the short duration of neoplasms in the race because the disease is only recognized at a late stage, and after all we only have the patient's statement as to duration. The difference in operability for cancer of the breast in the educated classes as contrasted with the advanced lesions seen in the manual laboring people is a commonplace matter to every physician of large clinical experience.

### CONCLUSIONS

1. Making cancer a notifiable disease would in time greatly increase our knowledge of the multifarious group of diseases now roughly grouped for statistical purposes under a single head of cancer.

2. It would stimulate the physician to early diagnosis, as he would be later checked up by someone else if he failed to diagnose the tumor promptly.

3. Such an official record would encourage the patient to make use of the best treatment and would do a good deal to inhibit the activities of the quack, who would be exposed to publicity through the premature death of his patient. This partial control of the patient's activities through the state or local boards of health is one of the most important collateral effects of such notification.

4. The compulsory registration of all cancer cases would be a check on the death certificates which are now frequently signed "heart disease" or "pneumonia" in deference to the family's wishes.

5. When such notification becomes fairly widespread, invaluable records of the rate of growth of tumors, and length of life of the patients (which are not synonymous) will be obtained. It is not too much to hope that within two decades it would be possible to have a still more complete record of the types of cancer which offer a reasonable chance of cure; in fact, microscopic slides from such patients, or a photomicrograph from such a slide would be a part of the death certificate. Only the larger hospitals now store microscopic slides from all their cancer cases in order to have a medico legal record as to the correctness of the diagnosis; but the development of county hospitals with more or less satisfactory laboratory services is rapidly going on and their records will ultimately be available.

The first step that must be made is to have the disease notifiable. We will then be able to get at the present crying need, which is not of mortality records, but of the number of people who have cancer in a community and the length of time which they live after such a cancer is discovered. How can one decide whether an operation or X-ray or radium treatment is justifiable even from the purely palliative point of view if there exist no trustworthy figures as to the length of life in a similar group of cases wholly untreated? And yet every patient with cancer offers this and other problems.

What is the chance of cure by removal of the tumor? If cure is not possible, will a palliative operation really prolong life, and if so how much? Does either radium or X-ray offer a better palliation in case removal is impossible? Will a combination of the two be better than either alone?

Making cancer a notifiable disease will not answer many, much less all of these questions, but it will in time solve some of them, and if we may reasonably hope for complete notification records throughout the country twenty years from now, a beginning must be made immediately. Do we not still suffer from the disgrace of being a civilized nation with a "registration area"?

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## DISCUSSION

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IN the light of many years' experience, I am absolutely convinced that the registration of cancer patients is feasible on the part of the local health authorities. The objections, raised in the light of local experience, which have proved a failure, do not in my judgment operate against the proposal. Such objections have always been raised against notification of other diseases, particularly typhoid fever, leprosy, and most of all, the venereal diseases. It will take time, of course, to build up a system of reasonably complete notification, but I am absolutely convinced that this is possible.

I am familiar with the unsatisfactory experience which has been had in Massachusetts. Dr. Lombard, Director, Division of Adult Hygiene, of the Massachusetts State Department of Health, writes me with reference to this matter, in part as follows:

This department feels that the reporting of cancer is not practicable at the present time. We attempted a cancer morbidity reporting area in the city of Newton with the idea of determining whether it was advisable to make cancer reportable for the state as a whole. This experiment was a failure, as only about one-third of the cancer in Newton was reported.

It would be expecting too much that a new movement in public health should be a success from the outset. The late Eugene R. Kelley, M.D., former State Commissioner of Health of Massachusetts, was firmly convinced that it was a practical possibility. It is all a question of intelligent statutory regulations and of sufficient force exercised on the part of the health departments with the coöperation of physicians to make the measure a reasonable success. But these are naturally reluctant to assume additional clerical burdens, and fail to realize that they are accountable to the community. Compulsion alone will insure success. I agree that voluntary coöperation is always a failure.

Dr. Lombard writes further to the effect that—

On three occasions we have questionnaired all the physicians in Massachusetts regarding the volume of cancer. About one-third of them replied, and from their answers we estimated that at any one time there are about twice as many cases as there are annual deaths.

I am satisfied that voluntary registration is a hopeless effort. The matter must be made a statutory requirement and derelict physicians must be held to account for their failure to obey the law.

Dr. Lombard also pointed out to me that an effort was made to obtain information by house-to-house surveys, and that five localities are at present being investigated in this manner, with other localities in prospect. But such an effort gives merely a cross-section on a given date and does not meet the real necessities of the situation. Not much of value has been forthcoming as the result of so-called sickness surveys just for the reason that they are merely cross-sections and do not present a continuous line of observations.

Cancer should be reportable because of the need for definite information as to the course followed in subsequent treatment. The real underlying reason for our present excessive cancer death rate and the increase in cancer mortality is due to the vast amount of superficial early treatment, responsible for delays which ultimately result in death. Until we take the cancer situation more seriously and remove it from the present-day apathy and indifference, no reduction in the rate by deliberate means and methods will be successful. Every suspicious tumor case should be promptly reported to the authorities, and every effort should be made to insure to the patient the best possible mode of treatment. That would be absolutely impossible without notification and I therefore sincerely trust that this Association will put itself behind a recommendation that cancer throughout the country be made a notifiable disease.

But this is merely the first step in the right direction. As a second step, there is the utmost urgency for a complete follow-up system, at least in all hospital cases. Cancer is a chronic disease which must be watched with the utmost care, even after operation. Countless persons fall victims to cancer because of post-operative neglect and indifference. Furthermore, there is the necessity of ascertaining a correct measure of operative results, and only collective aggregates on a large scale can give us figures useful for the purpose of public instruction.

Until the public has exact data showing the truly amazing results of early treatment in cancer cases and the ratio of survivals after a number of years, it will remain unconvinced about much of the present-day propaganda for early treatment. There is nothing else to go by than the assurance that early treatment affords a reasonable hope for a cure.

The methods in this respect which have been followed by the Ministry of Health of Great Britain, particularly in the admirable reports of Dr. Jane Lane-Claypon, are deserving of serious consideration. We need such statistics for this country for we have every reason for believing our American operative results and radiological results will prove equally encouraging, if not more so.

Mention may also be made of the encouraging statistics published in English by the Radiumhemmet of Stockholm on the great value of radium treatment. It is precisely such information that we are really most in need of for this country. In other words, in the light of my experience with cancer investigations, the first necessity at the present time toward a better solution of the problem of cancer control is the compulsory notification of cancer cases amplified by extended investigations into the post-treatment results whatever the method of treatment may be.

# The Duties of the Nursing Staff in a Health Department Communicable Disease Service\*

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BEFORE discussing the duties of a bureau of public health nursing staff to a communicable disease bureau, let us consider the aims of these two services. While the aims of a communicable disease bureau may vary in different communities, the following were named by the chief of this service in the Syracuse Health Department:

1. Disease prevention
2. Enforcement of legal requirements
3. Epidemiological studies and research
4. Health education
5. Coöperation with physicians

The aims of a public health nursing service are described by Dr. Tobey as follows:

Public health nursing has as its object the saving of life, the upbuilding of family health, and the promotion of community sanitation and hygiene; it deals with individuals and families in its efforts to restore the sick to health, to find and correct physical impairments, and to teach the practice of healthful living and the establishment of hygienic habits.<sup>1</sup>

Public health workers will see much in common in these aims, and the extent of service is limited only by the number of nurses available and the amount of contagion in the community.

The first means of measuring even a minimum of what might be expected in both services is given by the *Appraisal Form* of the American Public Health Association. The score is based on the following points: reporting, case investigation and recording, disease control, visits to cases, diagnostic service, hospitalization and immunization.

At first thought, it would appear that a nursing service had little to do with reporting of communicable diseases, but if the suspicious conditions reported by the nurse and verified by a physician are recorded, it will be found that she plays an important part. This was

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\* Read before the Public Health Nursing Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 4, 1929.

evidenced by our own experience in an epidemic of measles which extended over 3 years—1926–1928. During that period 8,421 cases were reported, of which 2,187 or 26 per cent were reported by public health nurses, 23 per cent by those of the Department of Health.

In case investigation and recording, the public health nurse is the ideal worker, as the investigation furnishes the observation necessary for adequate quarantine, securing laboratory specimens, advice on hospitalization and immunizations, and a basis for the needed number of follow-up visits. The keeping of spot maps and chronological charts belongs to the communicable disease bureau. They are of great value, however, to the nursing bureau in creating interest and renewed effort in a danger zone.

Perhaps the most important factor in the success of a nursing service is the type of nurse employed. The first study made by this section of the American Public Health Association was on qualifications for public health nursing positions.<sup>2</sup> The requirements suggested were progressive in the time element, so are still valuable. Beside the qualifications required for any public health nurse, the moral and social qualities—honesty, faithfulness and dependability—are greatly to be desired. Health departments usually are not free to search the country for this type of worker, frequently being limited by civil service to their particular communities. Their staffs are likely to have some nurses, both old in training and in years, appointed before standards were considered important. Many of these have grown professionally through valuable experience and personal development, while others have plodded along satisfied with the status quo. It therefore becomes the duty of the department or bureau to carry on a continuous educational program on the newer methods of treatment and control of communicable diseases. There is no field in public health where "new occasions teach new duties, time makes ancient good uncouth."

What are some of the important things the public health nurse should know?

1. The nurse should know how to teach personal and home hygiene.

The community that furnishes instruction in personal and home hygiene is building its strongest defense against communicable diseases. Diet, rest, exercise, cleanliness, good habits of eating, sleeping and working, care of food, sanitation and ventilation of the home, furnish subjects for home visits and group instruction; but to practice routinely washing the hands before and after handling food, and after using the toilet; to avoid the common drinking cup or towel; to cover

the mouth in coughing or sneezing; is another matter. Thus to improve living conditions requires the utmost tact, patience and perseverance of the worker. It is too obvious to suggest that the nurse herself should be the exponent of this teaching, also that she protect herself through annual physical examinations and such immunizations as the service demands.

2. The nurse should be familiar with the Sanitary Code of the state and city.

There is considerable variation in the codes of various states and even some in various communities of the same state. These, however, may not be less stringent than that of the state department of health. A glimpse at the variations noted in the chapter on "Control of Communicable Diseases," in *Public Health Bulletin 164*, is most convincing on this point.<sup>3</sup>

3. The nurse should know the symptoms, periods of incubation and isolation, and approved methods of treatment of all common communicable diseases.

Knowledge of symptoms is important as nurses calling in the home on other errands are frequently the first consulted on conditions appearing suspicious. A card diagram giving such data as period of quarantine for patient and non-immunes, as well as other contacts in all of the common contagions, is provided by many states and serves as a helpful reminder.

Some might take exception to the suggestion that the nurse should be informed on approved methods of treatment. The inference that from such knowledge the nurse might proceed to advise treatment and thus invade the province of the physician is of course obvious. Since a large number of families unfortunately never call a doctor, it is very much of a question whether medical advice by the nurse is not justified. Superstitions and unscientific home remedies are all too common and must be combated by urging the acceptance of modern scientific methods.

4. The nurse should be familiar with the nature of the various infectious diseases and their mode of transmission.

This information is indispensable for teaching methods of control, since most diseases are transmitted through personal contact, direct or indirect. The nurse must know how they may be transferred through contact, food, insects, and inoculation.

5. Above all, the nurse should know methods of control through:

Recognition and report  
Isolation of patient  
Quarantine

Disinfection  
Immunization



*Recognition and Report*—This requirement again emphasizes the importance of recognizing, especially, early symptoms. New York State puts the responsibility of reporting on the head of a private household or the person in charge of any institution, school, hotel, boarding house, etc. The physician, if present, bears the responsibility for instructing the family in precautions until a representative of the local health department calls. Many of the larger cities employ a diagnostician to verify major and rare contagions, after which the supervision is passed on to the nurse. When an epidemiological card is used it affords an easy and natural means of entrance into the home, and of securing helpful data on source of infection, contacts exposed, and possibilities of quarantine arrangements. When accurately obtained, these data serve as the basis for scientific studies which may add to the knowledge of disease and influence policies for its better control.

*Isolation*—In the case of a large family, crowded conditions, institutions, hotel, or boarding house, isolation is secured only through hospitalization. This is obtained in coöperation with the family physician or through action of the health officer. The sanitary code usually provides the necessary legal authority to enforce hospitalization if such facilities are available. It is interesting to note from the Report of the Committee on the Relation of Health Departments and Hospitals that health departments are utilizing general hospitals in many communities, the city paying for indigent cases on a per diem basis.<sup>6</sup> However, there will always be instances in every community needing care where no hospital facilities are available, in which case health departments should utilize the visiting nurse. From a review of a number of annual reports of visiting nurse services, it would seem that this custom is increasing; one report showed 14 per cent of all calls made were on communicable diseases. *Public Health Bulletin* 164 states that in 1924 many cities did not advise concurrent disinfection except where visiting nurses were permitted to give bedside care.<sup>6</sup>

It is the duty of the official nurse to teach the mother, or other adult assuming responsibility for the care of the patient, the technic involved. The demonstration method is preferred, Pillsbury pointing out that any prophylactic technic to be successfully carried out must (1) appeal to reason, (2) be simple, (3) be adaptable, (4) be economical of time and money, (5) be understood in order for it to be practiced effectively and taught.<sup>7</sup>

*Quarantine*—The tendency today is to make quarantine more lenient, especially as it affects contacts. New York's code was markedly changed in this direction last July. If the understanding and co-

operation of the public are secured, it will lessen the hardships imposed. The American Public Health Association *Appraisal Form* gives a minimum standard of home visits believed necessary for each disease during the period of quarantine.\* The public health nurse makes the ideal quarantine visitor. Her example in technic cannot fail to make an impression on the mother, especially when explained in simple and readily understood terms. When quarantine is broken her understanding of housekeeping, added to her technical knowledge, helps to make individual adjustments more readily than is possible for one without this training.

*Disinfection*—In teaching disinfection, it is important to know the location of the disease germs, and when and how to destroy them. Most germs are found in the discharges from the body. The daily care of this material as it is discharged is called concurrent disinfection, and instruction for its safe disposal must be very definite as to methods.

For the final or terminal disinfection, instructions are given for the clean-up of the patient and quarters. Most nurses can advise on the bath and shampoo but when it comes to the patient's room they frequently still think of fumigation when all that is required is thorough scrubbing with soap and water, plenty of air and sunlight. The length of time of exposure to sun and air depends on the strength of the sun's rays. Freezing should not be depended upon to destroy germs.

*Immunization*—Here especially is it necessary for the public health nurse to know the newest practices regarding control and treatment. She does not, of course, advise on treatment in the presence of disease if a doctor is in attendance but it is important that she know of the various vaccines, serums and toxins to answer questions intelligently, and urge immunization.

There is just one other thing that the writer would urge for an adequate alliance between a nursing bureau and all other bureaus requiring nursing services, and that is the adoption of the generalized form of nursing. True, the nurse under this system may lack highly specialized technic, but her broader understanding more than offsets this handicap and she usually enjoys a greater confidence of the people of her district. Furthermore, the ability to swing a large group of experienced workers into the contagious field in the face of an epidemic, or mobilize this group for any other special need, is no minor argument.

Beside all this, the nurse functioning in a generalized plan has an opportunity to arrange for the maintenance of the health of a family without the confusion which is apt to arise when two or more advisers

consult with the mother. Trying to meet all the health and social problems arising in a family is a challenge to the alert nurse, and offers an opportunity to do constructive work of the highest order.

The same set of nurses are on duty at all clinics and health conferences, and follow the children through the school health program. They inspect and supervise child boarding homes. With their knowledge of a family's health and social needs well defined, the generalized nurse does less transferring of information, with less opportunity for confusion in the home.

#### SUMMARY

The responsibilities and opportunities of a communicable disease nursing service in a health department should be—

1. Teaching personal and home hygiene to the family as a unit.
2. Recognition and reporting of probable communicable disease.
3. Establishment, supervision, and release of quarantine.
4. Propagandizing of accepted immunization procedure.
5. Securing adequate nursing care.

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## Malaria

**D**URING the summer and early fall of 1929, malaria appeared to be more than usually prevalent in many districts from which it had largely disappeared. In parts of Missouri, where malaria has been practically unknown for ten to fifteen years, quite a number of cases have been observed, and the correctness of the diagnosis proved by microscopical examination.

In the *Journal of the American Medical Association* for October 26, 1929, it is stated that focuses of malaria have developed in a number of the central counties of Illinois, and a warning is sounded of an increase for next year. Some fifteen counties in central Illinois have reported cases. It is well known that malaria was formerly quite common in Illinois, but the incidence of the disease had decreased greatly. The interesting feature of these reports is the explanation given by the State Department of Health, which attributes the notable increase to the use of automobiles and the contact with the South through such traffic. This explanation may be true, but we hope that a careful investigation will be made as to whether or not it is correct.

# The Administrative Significance of Proposed Changes in Standard Methods of Water Analysis\*

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THE primary purpose of *Standard Methods for the Examination of Water and Sewage* is to establish uniform methods for use in public health and other laboratories for testing the potability of water supplies; it also endeavors to furnish laboratory procedures for the control of water purification processes. I hope that a further result has been the stimulation of laboratory workers to improve on the published methods and to devise new and better ones. The standard procedures have also been used for the sanitary examination of swimming pools; for investigations of stream, lake and harbor pollution; and for the analysis of sewages and sewage effluents. Certain of the methods for mineral analysis of water have also been included.

The last (sixth) edition was prepared under the supervision of committees of the Laboratory Section of the American Public Health Association, the American Water Works Association and the American Chemical Society. While the methods recommended are generally regarded as the "Standard Procedures," it is a fact that many laboratories deviate from them to a greater or less degree. In some instances antiquated procedures have been retained; in others, newer ones have been adopted; but in many instances the deviation from Standard Methods has been because of some special local conditions. It is therefore wise to make a periodic survey of the recommended procedures. I shall try to present to you, as briefly as possible, the changes that have been suggested for consideration in preparing the seventh edition, and shall dwell particularly on those that have a direct bearing on administrative control.

It cannot be emphasized too strongly that what I have to say is tentative in character. The changes that will be discussed have not been adopted, and at least a year will elapse before final action on

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\* Presented at a Joint Session of the Public Health Engineering and Laboratory Sections of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 4, 1929.

any of these proposals can be taken by this Association. There is, therefore, time for further discussion and criticism.

*Chemical Methods*—No changes are contemplated in the methods intended for sanitary chemical examination. In connection with the mineral analyses, however, numerous suggestions have been made. There appears to be rather general agreement that the "drop-ratio" method for determining the hydrogen ion concentration should be abandoned. It is too crude to be recognized as a standard procedure. Furthermore, there is no necessity for such a method since there are now available excellently prepared buffer standards. In addition to the hydrogen electrode potentiometer method the quinhydrone cell is now available for rapid and fairly accurate work. In the preparation of laboratory mediums, colorimetric methods, if carried out with carefully prepared buffer standards, will probably continue to take precedence.

It has been suggested that a method for the determination of phosphates be included and that a simpler quantitative test for manganese be tried. The method for the quantitative estimation of hydrogen sulphide must also be revised. The present edition gives methods for the separation of sodium and potassium. There is some doubt as to the advisability of including these procedures. Since a complete mineral analysis of a water is somewhat laborious, those interested in water softening processes have devised more rapid although less accurate methods for obtaining the information essential for these processes. It seems that some of these rapid methods might well be recognized as standard procedures. The same is true of those for the detection of chemicals used in water purification, such as alum, ferrous sulphate, soda ash, lime and calcium hypochlorite. The methods would include only those that are recognized as both accurate and practical. A method for the estimation of iodides has also been suggested as of possible value.

Some criticism has been made of the present methods for determining the turbidity of waters. Such a determination is of great value in connection with water filtration. Baylis has suggested that all turbidity measurements be referred to the values obtained with the Jackson turbidimeter.

*Sewage Examination*—The temperature for drying of solids is now given as 103° C. In water examination, the standard temperature is 180° C. This discrepancy should be removed. Probably 180° C. should be adopted for both materials. The inclusion of methods for the determination of total, fixed and volatile sulphides has been suggested. It is not quite clear whether the analytical procedures

have been sufficiently standardized to include them at this time. A quantitative procedure for the determination of phenols would seem to be an excellent addition to the present methods. There is no doubt that the presence of these substances in water supplies must be taken into account. Several modifications of the method of Gibbs have been investigated, and I believe that agreement on at least a provisional procedure could be obtained. A very desirable but difficult determination is that of settleable solids in sewages. The standardization of some method such as that devised by Imhoff, or some modification of this, might well be recommended. At present there is little uniformity in such determinations.

*Microscopic Methods*—The present microscopic methods are inadequate. This section of the book must be revised and enlarged. It is well known that higher organisms are of great importance in reservoirs and in connection with the self-purification of streams. A committee has been asked to make revisions but in addition to those on this committee, it is highly desirable that others interested should offer criticisms and suggestions. There is nothing definite to present at present.

*Bacteriological Methods*—More discussion has centered about these procedures than other sections of "Standard Methods." The referee for the Committee on Standard Methods has prepared a careful report. I shall summarize his proposed changes, omitting, however, some few which concern only minor details. The present method for sterilization of glassware calls for a "temperature of not less than 160° C. for not less than one hour." It is believed by some that this temperature and time, when carefully adhered to, give satisfactory results. Others maintain that the leeway is too small and that a higher temperature, such as 170° C., should be specified. Where the temperature in the oven is known to be uniform throughout, 160° C. might be allowed.

It has been recommended that the instructions for the preparation of nutrient agar should omit the directions to "cool to 45° C. in a cold water bath then warm to 65° C. in the warm bath without stirring." As far as I am aware, this is almost never adhered to and there is little reason for doing it.

Trouble has been encountered in the preparation of Endo medium. It is believed, however, that the directions as given will produce satisfactory results provided certified fuchsin and chemically pure anhydrous sodium sulphite are used. However, an alternative procedure might be considered.

Attention should be called to the water used for dilution of samples

to be plated. Under no conditions is it desirable to use distilled water. No definite suggestions have been offered for a synthetic dilution water, but it is hoped that some will be forthcoming.

Some bacteriologists feel that a simple stain rather than that of Gram should be used for the identification of *B. coli*. This would necessitate a change in the definition now used for the coli-aerogenes group. I have been able to find very little support for this suggestion.

One important item refers to the necessity of obtaining isolated colonies on plates containing either Endo or eosin-methylene-blue medium. The characteristic reaction often fails to appear unless such colonies are obtained, and organisms of the coli-aerogenes group are consequently not reported as required in the partially confirmed and completed tests. Since many laboratories doing routine work do not carry the tests through, it is important to make the partially confirmed test as accurate as feasible. If this suggestion is approved, it will result in an increased number of *B. coli* being reported.

The present edition suggests tests for differentiation of fecal from non-fecal members of the coli-aerogenes group. This section was included because the committees felt that such procedures might be of value to workers in the smaller laboratories who do not have many books available. It was also thought that further work would be stimulated by giving some prominence to the methods. During the past two years, several new mediums have been devised for the differentiation of members of the group, some of which will be discussed later. The section has been criticised because it is not recognized as being included in the standard procedures and the referee acting for the Committee on Standard Methods has recommended its elimination. His recommendation has not been favorably received.

*B. coli* may be completely killed in a lactose broth medium at the end of 48 hours if the acidity of the medium attains a pH of about 4.2. Accordingly, if the standard procedures are carefully followed, many tubes which contain gas at the end of 48 hours do not give the confirmatory test for *B. coli*. It is therefore recommended that all tubes showing gas at the end of 24 hours should be tested for the presence of the coli-aerogenes group by transferring material to an Endo or eosin-methylene-blue plate. This suggestion was made in the present procedure but was not consistently followed. Another method for accomplishing the same result as far as survival of this group is concerned, would be to add buffer salts to the standard lactose broth. Preliminary work by Butterfield has shown that phosphates might be used for this purpose.

The most important suggestion in connection with the determina-

tion of the coli-aerogenes group organisms has been in connection with the use of a brilliant green bile medium. According to the work of Jordan, Dunham and their collaborators, this medium should contain 2 per cent of bile, with brilliant green in amounts sufficient to give a concentration of 1/75,000. The reaction after sterilization should be between pH 7.1 and 7.4. A very large amount of material has accumulated which indicates the value of this medium both for a primary inoculation in parallel with the standard lactose broth, and as a secondary medium for the partially confirmed test. Opinions on the use of this medium are, however, not unanimous, but it seems that certain definite suggestions could be formulated so as to allow the medium to be used in a way satisfactory to most laboratory workers.

The present edition of *Standard Methods of Water Analysis* suggests one method for reporting the results for the coli-aerogenes group on the basis of numbers per c.c. or per 100 c.c. Much difference of opinion exists as to the best form of calculation for these results. On the one hand there are some who advocate a simple reporting on the basis of number of tubes confirmed for this group. Others advocate a more complex and, possibly, a more mathematically correct procedure. The matter will have to be straightened out through frank discussion.

It has been suggested that the method for preparation of broth mediums be so written that after the addition of the water sample, the medium will be of a uniform composition. This would necessitate the preparation of a more concentrated medium where 10 c.c. portions are to be used, and the use of a definite amount of this medium in each tube. This is a practical suggestion.

The large and well equipped laboratory with experienced workers does not need as definite directions as may be required by the small laboratory and the relatively inexperienced worker. It has, therefore, been suggested that for the examination of finished waters a definite number of portions of given size be used in conformity with the requirements of the U. S. Public Health Service. The following set-up of tubes might be recommended—five 10 c.c., one 1 c.c., and one 0.1 c.c. portions.

Standard Methods makes a very definite recommendation in regard to the lens used for counting bacteria. As a matter of fact, this recommendation is rather generally disregarded. Either no lens is used, or some method of lighting and magnification devised in the laboratory, or some commercial apparatus may be at hand. Where a large number of plates are counted each day, the hand lens is unsatisfactory. Agreement should be reached on this point.



During the past two years a number of mediums have been devised for counting coli-aerogenes group organisms by the use of direct plating methods. It is claimed that these will not only give a direct count, but will differentiate fecal from non-fecal strains. While it is recognized that such mediums would be of great value in water examination, their use has not been extended over a wide enough range of laboratory workers to warrant their inclusion in Standard Methods at present.

The Committee on Standard Methods of the Laboratory Section has recommended the inclusion in the next edition, as a supplement, of the report of the "Advisory Committee on Official Water Standards," appointed by the Surgeon General of the U. S. Public Health Service. Their recommendations are known to be the generally accepted standards in this country, and it is felt that it would greatly add to the value of the volume if they could be included. Permission from the Surgeon General is being requested in order to carry out this recommendation.

*Swimming Pools*—With the development of adequate methods for the purification of swimming pool water it has been necessary for the laboratory to examine specimens at frequent intervals as a control on the operating procedures. It is recommended that methods for the examination of water be used also for the examination of swimming pools with the understanding that the portions used for analysis be varied according to the extent of purification. No attempt would be made to suggest standards for interpretation of the results, since they are not considered pertinent to the other laboratory procedures described. Methods for the examination of swimming pools for respiratory organisms must await further work.

#### SUMMARY

I have attempted to enumerate the most important suggestions that have been made for changes in the present edition of *Standard Methods for the Examination of Water and Sewage*. These changes have for their object the inclusion of additional methods for the Chemical Analysis of Water and Sewage so as to increase the usefulness of the book. Such proposed additions include rapid methods for boiler water analysis, the determination of phenols in water and sewage and the analysis of chemicals used in water purification.

The proposed changes in the bacteriologic methods are made with the object of simplifying the control of plant operation by laboratory methods, including the recognition of the fact that such methods must be distinct from those used for the final analysis of a finished water.

The plant manager at present is inclined to use methods other than those regarded as standard, because they have not proved practical from his standpoint.

The proposed changes in the bacteriologic methods will tend to increase the number of positive presumptive tests partially confirmed and completed. These results can be accomplished by more careful attention to some of the details in the procedures.

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## Milbank Memorial Fund Demonstrations

**M**ARKED reductions in deaths from preventable causes have occurred in demonstration communities where the Milbank Memorial Fund is spending \$2,000,000 in public health promotion.

The 1928 death rate from tuberculosis in one of the communities, rural Cattaraugus County in New York State, is reported as the lowest on record in that county—39.1 per 100,000 population. This is the fourth successive year in which the death rate from this disease has been below any annual rate prior to the inauguration of the demonstrations.

Over the past four years, fewer deaths from diphtheria have been reported from Syracuse, another of the demonstration communities, than at any time during the recorded history of the disease in that city, which reaches back over the past 29 years.

New York Health Demonstrations were begun in 1923, the Fund having made appropriations to supplement the resources of public and private health agencies in three demonstration localities in New York State, in order to help them develop locally effective and adequate public health administrative machinery. In addition to the rural Cattaraugus County and the urban Syracuse demonstrations, a third is in progress in the metropolitan Bellevue-Yorkville district of New York City.

It is estimated that a reduction of over 40 per cent in diphtheria cases among children of school age resulted from the prevention campaign carried on in Syracuse. A reduction of 39 per cent in a similar group is attributed to the immunization campaign in Cattaraugus County. In the latter demonstration center, over 60 per cent of the population in the ages 6 to 11 have been given the preventive treatments for diphtheria.

In the Bellevue-Yorkville Health Demonstration in New York City, progress has been notable in the administration of toxin-antitoxin to the children of the district; in the development of a program of health education and of a tuberculosis consultation service; and in forwarding a campaign for regular and more intensive physical examination of school children.

While in its twenty-four years of activity the Fund has made substantial grants for the advancement of social welfare and general education and, to a lesser degree, for charitable relief, considerably over half of its income has been devoted to the promotion of public or community health—to aid in the acquisition and application of knowledge and methods for improving the health and vitality of people. The Fund has coöperated in many such enterprises other than the New York Health Demonstrations—some of them in remote parts of the world, but the majority in the United States, and particularly in the City and State of New York.

# Annual Health Department Reports\*

THE committee has given its chief consideration this year to the kind and form of tables which should be presented in the annual health department report. These tables are mainly related to vital statistics and communicable diseases, although certain other tables are believed to be desirable. It is believed by the committee that somewhat more detailed historical statistical tables should be presented once in 5 years than is necessary every year, and a subsequent report will suggest quinquennial tables for this purpose.

The health department report is usually prepared for the health officer, the press, city officials, civic leaders, schools, libraries, and for exchange with other agencies. The report serves as a city record as well as for the health officer's purpose of "taking account of stock." The statistical information contained in the report is the fuel of the epidemiologist. The value of the report depends in no small degree upon the early availability of this material for research work and program planning.

Every annual report, regardless of the size of the community, should contain tables showing the births, deaths, stillbirths and marriages, together with the population for the past 10 years. These might also include infant deaths and infant mortality rates.

TABLE I  
POPULATION, BIRTHS, DEATHS, MARRIAGES, WITH RATES

Year	Population Est. July 1	Births (still- births excepted)		Deaths (still- births excepted)		Stillbirths		Marriages	
		Total	Per 1,000 Population	Total	Per 1,000 Population	Total	Per 1,000 Births	Total	Per 1,000 Population
1920									
1921									
1922									
1923									
1924									
1925									
1926									
1927									
1928									
1929									

For quinquennial reports, which may be prepared in greater detail

\* Report of Sub-Committee on Annual Health Department Reports of the Committee on Administrative Practice of the American Public Health Association, May 28, approved December 5, 1929.

and with more comparative data, it is suggested that the above table be modified to give data for each census year, for as long a period as such data are available, preceding the quinquennial period of the report. It is desirable that all statistical tables be accompanied by sufficient descriptive text to render the data clear and interesting.

Births should be classified, as in Table II, and it is suggested that a legitimacy column may also be added.

TABLE II

BIRTHS, BY SEASON, SEX, COLOR, AND KIND OF OBSTETRICAL CARE

Months	Males	Females	Total	Colored Children Included in Preceding		
				Males	Females	Total
January						
February						
March						
April						
May						
June						
July						
August						
September						
October						
November						
December						

Obstetrical Care	Number	Per cent
Hospital		
Home, private		
Home, clinic		
Midwife		
Total		

If it is desired to correlate the kind of obstetrical care with parentage of mother, the following is suggested:

Obstetrical Care	Color and Nativity				Parentage		
	Native White	Foreign Born White	Negro	English	Irish	Italian	Portuguese, etc.
Hospital							
Home, private							
Home, clinic							
Midwife							
Total							

Table III classifies deaths by sex, cause and age. This is the largest table in the report and may be used for all communities of over 25,000 population. If more than 10 per cent of the population are colored, another table might be made for this group.



Deaths under 1 year should be classified by cause and age. Season and color may be likewise included if desired.

TABLE V

DEATHS UNDER 1 YEAR BY CAUSE AND AGE, 19—

No.	Cause	Under 1 Day	1 Day and under 2 Days	2 Days and under 3 Days	3 Days and under 4 Days	4 Days and under 5 Days	5 Days and under 6 Days	6 Days and under 7 Days	7 Days and under 8 Days
7 9 10	Measles Whooping Cough Diphtheria (etc.)								
	Totals								

No.	Cause	1 Week and under 2 Weeks	2 Weeks and under 3 Weeks	3 Weeks and under 1 Month	1 Month and under 2 Months	2 Months and under 3 Months	3 Months and under 6 Months	6 Months and under 9 Months	9 Months and under 1 Year	Total under 1 Year
7 9 10	Measles Whooping Cough Diphtheria (etc.)			1	2	2 1	8	6 9	10 7	16 29 1
	Totals									

A table showing deaths under 1 year of age according to the nativity of the mother may be used for larger cities, and should be included in quinquennial reports. A table showing puerperal deaths by cause and obstetrical care, with the age and mother's nativity, is desirable although not always essential.

For the tabulation of cases and deaths of reportable diseases, the committee suggests the use of the table adopted by New York State.

A table should be included to indicate the hospitalization of communicable diseases and Table VII carries suggestions.

The final table should be a classified financial statement for the year of the report. Comparisons with the previous year may be used

TABLE VI

## REPORTABLE DISEASES: CASES AND DEATHS BY MONTHS, AND ANNUAL CASE, DEATH, AND FATALITY RATES, 19—

Int. List Nos. (Third Revision, 1920)	Causes of Sickness and Death (Listed in order of New York State Sanitary Code)	Total					Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	
		Cases	Deaths	Rates *															
				Case	Death	Fatality													
27	Anthrax																		
175	Botulism †																		
25	Chickenpox †																		
14	Cholera (Asiatic)																		
10	Diphtheria (membranous croup)																		
16	Dysentery (amebic and bacillary) †																		
23	Epidemic encephalitis																		
24	Epidemic cerebrospinal meningitis																		
11	Epidemic influenza																		
109	Epidemic or streptococcus (septic) sore throat †																		
21	Erysipelas																		
25	German measles †																		
26	Glanders																		
5	Malaria																		
7	Measles																		
13	Mumps																		
40	Ophthalmia neonatorum (suppurative conjunctivitis of the newborn) †																		
1	Paratyphoid fever †																		
17	Plague																		
100, 101	Pneumonia																		
100	Broncho or lobular																		
101	Acute lobar																		
22	Polionyelitis, acute anterior (infantile paralysis)																		
46	Puerperal septicemia																		
28	Rabies																		
8	Scarlet fever																		
6	Smallpox																		
29	Tetanus																		
85	Trachoma †																		
31-37	Tuberculosis, pulmonary																		
	" other forms																		
1	Typhoid fever (except paratyphoid) †																		
2	Typhus fever																		
109	Vincent's angina †																		
9	Whooping cough																		
38	Syphilis																		
40	Gonorrhea †																		
39	Chancroid																		

\* Rates per 100,000 population, except fatality rate which is the number of deaths per 100 reported cases. Fatality rates almost certainly overstate the virulence of a disease since usually not all cases are reported.

† This title includes only the disease named, not all that are classified under the *International List* number given.

TABLE VII  
CASES OF COMMUNICABLE DISEASES HOSPITALIZED

<i>Diseases</i>	<i>City Cases</i>	<i>Number Removed to Hospital</i>	<i>Per cent</i>
Diphtheria			
Scarlet fever			
Measles			
Smallpox			
Typhoid fever			
Poliomyelitis			
Cerebro-spinal meningitis			
etc.			

in place of the cents per capita column in Table VIII.

TABLE VIII  
SUGGESTED FORM OF FINANCIAL STATEMENT \*

For the year ending December 31, 1927

<i>Receipts</i>	<i>Total</i>	<i>Cents per capita</i>
1. Appropriations, salaries.....	\$171,190	171.2
2. Other expenses.....	25,000	25.0
3. Nursing fees.....	15,210	15.2
4. Communicable disease hospital.....	20,000	20.0
5. Miscellaneous receipts.....	900	00.9
	<u>\$232,300</u>	<u>232.3</u>

<i>Expenditures</i>	<i>Salaries</i>	<i>Maintenance</i>	<i>Total</i>	<i>Cents per capita</i>
1. Administration				
A. Administration.....	\$11,000	\$2,500	\$13,500	13.5
B. Public Health Education.....	2,200	2,000	4,200	4.2
2. Vital Statistics.....	4,000	500	4,500	4.5
3. Communicable Disease Control				
A. Epidemiology.....	6,800	2,000	8,800	8.8
B. Tuberculosis.....	6,400	1,500	7,900	7.9
C. Venereal Diseases.....	6,400	2,500	8,900	8.9
4. Child Hygiene				
A. Maternity, Infant and Preschool Hygiene..	9,000	1,500	10,500	10.5
B. School Hygiene.....	20,500	2,000	22,500	22.5

(In like manner, list other activities: Sanitation, Food and Milk, Laboratory, Public Health Nursing, etc.)

\* Figures from Summary Budget Revised Plan of Health Organization for City of 100,000 Population. *Community Health Organization*, A. P. H. A., 1927.

A supplementary statement of official expenses for public health not included in the health department budget, such as vital statistics or hospitalization, should be added. Activities listed which are not strictly public health measures should be starred.

In addition to the above tables, summary tables of inspection, nursing, laboratory, medical and clinic activities should be presented with appropriate descriptive text. Subsequent reports of the committee will outline such tables in greater detail.



It is recognized that the publication of statistical tables is expensive, and for this reason some health departments, including Providence, R. I., have utilized zinc cuts from typewritten proofs, with resulting material savings.\*

#### SUGGESTED CHARTS FOR ANNUAL OR QUINQUENNIAL REPORTS

1. Organization chart of department
2. Trend of population
3. Trend of expenditures
4. Birth rate
5. Infant mortality rate
6. Death rate (all causes)
7. Death rates from the 5 or 10 locally principal causes of death

#### PHYSICAL MAKE-UP

*Size*—The size should be convenient for reading and filing, preferably 6" x 9", allowing about 3¾" x 6½" for the printed page.

*Paper*—Good paper, adapted to the character of the report, preferably without a glossy finish, is recommended. Coated paper is distressing and is used only because it takes half tones easily. If this must be used, dull coated paper is preferable, but if there are no half tones, coated paper should not be used.

*Type*—The choice of type is obviously an important question, and in general it is well to stick to a few standard faces on which there is no possibility of going wrong. A reliable printer is highly desirable. Legibility is dependent principally on the length of line in relation to type used and the space between the lines. Ten point should be set not wider than 4 inches; and 8 point not wider than 3 inches. Ten point type, if properly used, is sufficiently large for effectiveness in city reports.

*Appraisal Form*—Several health officers have effectively introduced into their reports the *Appraisal Form* schedule of the Committee on Administrative Practice of the American Public Health Association. Even if a rating is not made on the *Appraisal Form*, the questionnaire portion of the publication is useful as an outline of data to be included in a report.

*Literary Style*—The text should be clear and concise, reflecting proper attention to grammar, sentence structure, and diction.

*Balanced Content*—The material should show a complete picture, and each activity should occupy space in proportion to its relative importance.

C. V. CHAPIN, *Chairman*,  
J. A. DOULL,

IRA V. HISCOCK,  
W. F. WALKER, *Secretary*.

\* From a typewritten copy of the table, a line cut one-half size is made, saving in labor and proof reading. Care must be taken to use a good, clean ribbon and to have the typewriter itself well cleaned. Choice of type is important as the reduction is the same in thickness of lines as in size of letters. Tables III, IV, V, and VI may be made by this method.

# Seasonal and Age Studies of Poliomyelitis and What They Suggest\*

W. LLOYD AYCOCK

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A PREVIOUS study of the age distribution of poliomyelitis in comparison with that of measles and diphtheria,<sup>1</sup> in which diseases the phenomena responsible for age distribution can be measured by direct observation or test, indicated that the virus of poliomyelitis is widespread and that it sets up a widespread immunity to the disease. It was concluded that the incidence of the disease is not in reality a measure of the extent of the distribution of its virus but is limited to a great extent by existing immunity which must have come from previous exposure to the virus.

This observation raised the question as to what determines the result of initial exposure to the virus—the frequency with which it causes an actual attack of the disease or produces (or at least begins) a sub-clinical immunization which may or may not be reinforced by subsequent exposures. While this study suggested that the frequency of the occurrence of the disease was not a function of facility of contact, it gave no indication as to whether immunization or disease is the result of some quality of the virus in respect to dose or virulence, or of some quality of resistance on the part of the host.

In a second study<sup>2</sup> evidence was presented which indicated that the extent of the distribution of the virus is the same in warmer climates, where the incidence of the clinical disease is less, as in cooler climates where the disease has its greatest incidence. An analysis of variation in incidence together with seasonal fluctuation in cooler and warmer climates indicated that the climatic variations could hardly be attributed to corresponding variations in the facility with which the virus is transmitted or in its virulence. It was shown, however, that the seasonal fluctuation, as well as the incidence, correlated with the extent of seasonal fluctuations in climate but not with climate itself. In other words, poliomyelitis is a disease of warmer seasons

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\* Read before the Epidemiology Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 3, 1929.

but of cooler climates, its incidence, generally speaking, varying directly with the magnitude of the change from the colder to the warmer season of the year, but not with the warmth of the climate itself.

It is known that numerous bodily functions undergo corresponding seasonal fluctuations doubtless in the nature of normal adjustments of the body to a varying environment. It was pointed out that some of these seasonal fluctuations in physiologic functions bear a direct relation to the occurrence of certain noninfectious diseases; to susceptibility to certain chemical compounds, the toxicity of which depends on the rate at which they are broken down in the body into their poisonous constituents, and which rate varies with the seasonal activity of certain bodily functions; and that susceptibility to certain infections is influenced by physiologic factors which undoubtedly undergo similar seasonal variations.

This study led to the opinion that resistance to poliomyelitis in the first instance may lie in a balance between some as yet undetermined physiologic processes which undergo seasonal fluctuations and vary in different climates by way of adjustment of the body to different or changing environment. Failure of the seasonal adjustment would result in a deficiency or discrepancy which would be greater in cooler climates where fluctuation in the seasons is greatest, and least in warmer climates where fluctuation is least. It was pointed out that certain observations regarding the type of individual in whom the disease seems to occur with greater frequency than in the average, a type suggesting some physiologic imbalance, tended to support this hypothesis.

In order to define more clearly this kind of resistance to disease as a matter of convenience; to distinguish it from immunity (i.e., resistance which arises as a reaction product between the infecting agent and the host) as well as to call attention more sharply to a form of resistance which since the advent of the germ theory of disease has, I believe, been neglected; I have suggested that it be designated by the term "autarcesis," which may be defined as the power to resist infection which resides within the individual's normal physiologic functions and which does not require the provocation of the infectious agent for its production.

From this conception of the epidemiology of poliomyelitis some idea of the nature of the virus reservoir of the disease can be formed which is in accord with other observations which need not be enumerated here. Furthermore, from an analysis of some of the general features of the disease some notion may be gained of the probable behavior of this virus reservoir which cannot be ascertained with the

limited facilities available for the actual detection of the virus. This question has long been before students. Where does the virus maintain itself in areas where, and at times when, the disease is highly prevalent, in interepidemic periods, in areas where the incidence of the disease gives no hint of its presence other than the occurrence of sporadic cases, or more or less widely spaced outbreaks, and in the winter and spring when its presence is indicated only by occasional cases?

I have previously pointed out that we need not look for any condition peculiar to any one area which would serve as a virus reservoir. This is obvious from the simple fact that no part of the inhabited world is entirely free of the disease, and is further emphasized by the fact that regardless of the incidence its age distribution indicates an equally widespread immunization and, hence, an equally widespread distribution of the virus in all parts of the world from which figures are available.\*

Since the widespread process of immunization which has been referred to apparently takes place with a rapidity corresponding to concentration of population, as is the case with such well known contact diseases as measles and diphtheria, it seems reasonably certain that the mode of dissemination of the virus of poliomyelitis is likewise by direct person to person contact. No evidence has been found that the virus reservoir may lie largely in chronic carriers. No instances are known where one individual seems to have been responsible for the transmission of the virus to any number of others over a considerable length of time. It would rather appear that the virus reservoir is in reality the upper respiratory passage of large numbers of individuals who, so far as the evidence indicates, harbor the virus for a relatively short time during which by far the largest proportion acquire an immunity without showing obvious signs of the disease. It is still a question as to what proportion of individuals may show mild symptoms following an infestation, known as abortive poliomyelitis, or what proportion of them become immunized without any noticeable reaction to the virus.

There is no positive indication that the virus of poliomyelitis can actually be transmitted with greater facility at one season than another. In fact, we now see that increased opportunities for contact due to closer aggregation of the population in winter, long supposed to be responsible for the seasonal prevalence of the common contact diseases, can hardly be the true explanation. If this were true one

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\* There is only one probable instance of the introduction of the virus into a virgin population. On the island of Nauru, in 1910, the disease reached a very high incidence and apparently occurred with equal frequency at all ages.

seasonal curve should be common to all these diseases; and the seasonal curve of none of the contact diseases has been shown to coincide with variations in the aggregation of population. For example, the seasonal increase in diphtheria long supposed to follow the opening of schools, actually is on the upward trend before the opening of schools. Finally, it remains to be shown that the magnitude of seasonal variation in "opportunities for contact" even begins to approach the seasonal variations in the prevalence of these diseases.

In view of previous studies mentioned, which suggest an autarcetic factor which varies with season, one can at least raise the question whether an initial infestation with the virus of the disease produces the clinical disease or an immunity, largely according to the season of the year when infestation takes place. In this connection it may be stated that while mild cases are not infrequently detected, solely by reason of their proximity to frank cases, we have not found evidence that any considerable number of such mild febrile attacks, which might be regarded as abortive poliomyelitis, occur as an undercurrent of summer outbreaks of the frank disease. However, the evidence in regard to the age distribution indicates that the large majority of the population acquires an immunity in the course of a life time. This would imply that infestation with the virus is correspondingly widespread, from which it may be inferred that, on the average, approximately 1 out of 50 of the population receives an initial exposure each year, or 1 out of 600 of the population in any given month.

In the hypothetical case of a city of 100,000, shown in Figure I, approximately 166 initial exposures would occur each month. It might well be supposed that the virus of poliomyelitis might be spreading with equal rapidity throughout the year, but that during the winter and spring months by far the vast majority of initial exposures would produce no symptoms, or some mild reaction not recognized as poliomyelitis; while as the summer season arrived, on account of a general diminution in autarcesis, a larger and larger proportion of infestations would result in attacks of the recognizable disease rather than in a mild reaction which would pass unnoticed.

In the hypothetical case illustrated, it will be seen that an epidemic of an intensity which is seldom exceeded (2 cases per 1,000 population) could occur in the summer season without any actual increase in the rate of dissemination of the virus. It is not to be understood that this moving virus reservoir is necessarily present in every locality all the while. Local epidemics may follow its introduction or presence during the season of anautarcesis (summer and fall), or if a particular locality has been visited by the moving reservoir during the

season of autarcesis (winter and spring) a wave of immunization would result which would render that community relatively free of the disease for a time. Of course many communities may pass through

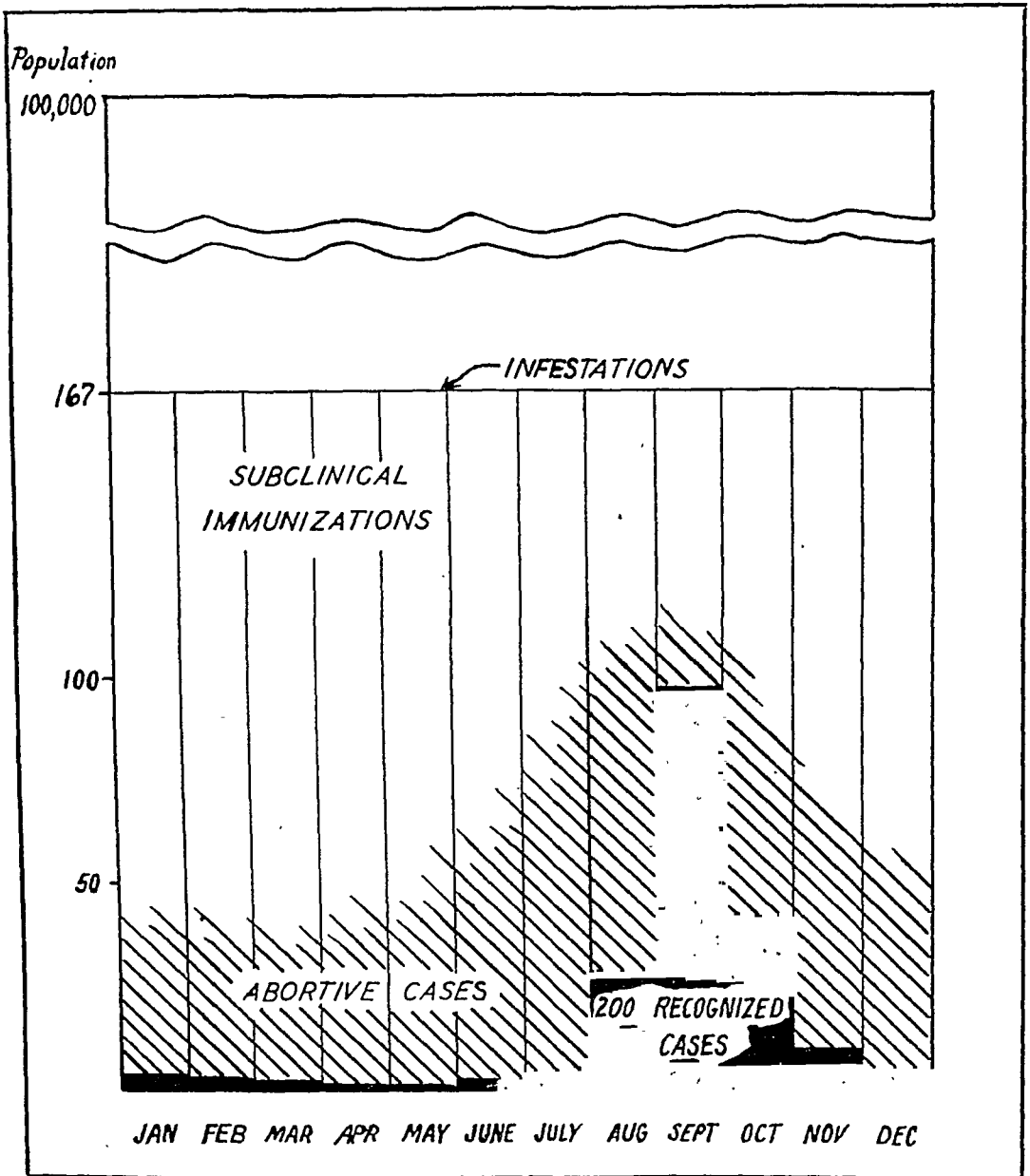


FIGURE I—This represents a hypothetical community of 100,000, in which initial infestations with the virus of poliomyelitis take place with an even frequency throughout the year, and in sufficient numbers to "saturate" the population in the course of an average lifetime of 50 years. ( $1/50 \times 100,000 \times 1/12 = 167$  infestations per month.) This implied rate of dissemination is sufficiently rapid to bring about a practically universal immunization.

The solid area on the chart shows the occurrence of a severe epidemic (2 cases per 1,000 population) of recognizable cases which could occur without any increase in the rate of dissemination of the virus. The remainder of the supposedly uniform number of infestations represents, in unknown proportions, subclinical immunizations or abortive attacks.

the summer season when the virus reservoir happens not to be present and remain free of an outbreak, but at the same time there would be an accumulation in the number of non-immunes.

I wish it understood that the conception of the virus reservoir of poliomyelitis which has been outlined is only a probability, but a probability which is in accord with numerous observations at the bedside, on the statistical chart, and in the experimental laboratory, none of which alone would be conclusive, but all together begin to take on a real significance.

This conception of the epidemiology of the disease is presented with the idea that if its validity be supported by further observations, future studies looking to its control could proceed along more clear-cut avenues of approach rather than by chance and laborious exploration of innumerable possibilities. Thus, if this idea of the virus reservoir is correct, there does not appear to be any great promise in attempts to curtail the spread of the virus. From the experimental point of view our present knowledge indicates that artificial immunization, if accomplished, is likely to be by methods too tedious and uncertain for practical application. These studies, therefore, suggest that we should turn from the pursuit of the bacteriology (if this term may be applied to a virus disease) and immunology of the disease to an exploration of its autarcesiology in our search for means of prevention.

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NOTE: This work is supported by the Harvard Infantile Paralysis Commission, the Vermont State Department of Health, and the International Committee for the Study of Infantile Paralysis.

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## Periodic Medical Examination for Bus Drivers

THE sudden illness of a motor omnibus driver led to an accident which only fortunate chance prevented from having fatal results. The possible consequences of such accidents are so serious that the *London Daily Mail* advocates precautions against them. The example of the railways, where drivers are subjected to a searching medical test on appointment, and annually thereafter, is an admirable one. Something of the kind is already done by the London General Omnibus Company, which at least examines its new drivers and insists on a fresh test before a man who has been seriously ill returns to work. But not all the smaller proprietors are quite so careful. The *Daily Mail* advocates a systematic medical test, repeated at regular intervals, for every driver of a public conveyance. Our contemporary might have gone further and advocated the regular medical examination of all drivers of automobiles, public or private.—*Diplomate*, Sept., 1929.

# Standardization of the Wassermann Test\*

IN 1928, an investigation of some of the more widely used precipitation or flocculation tests was undertaken, since a study of the complement-fixation test did not seem complete without a determination of the comparative value of these fundamentally similar reactions which are being more and more employed as an aid in the diagnosis of syphilis. During 1929, it has been possible to make a more comprehensive comparison of certain of these tests, namely, the Kahn—both the routine and presumptive procedures—the Kline slide test, the Sachs-Georgi reaction, Müller's Ballungsreaktion, Meinicke's Trübungsreaktion, and to a slight extent his Klärungsreaktion.

The routine Kahn precipitation test was studied the most extensively, having been compared with complement-fixation in the examination of 10,455 specimens. The results obtained agreed approximately with those of the test with the cholesterolized antigen in 9,088 instances, or 86.9 per cent. Of the specimens which gave disagreeing results, nearly fifteen times as many reacted more definitely in the test with the cholesterolized antigen than in the Kahn, a large proportion not reacting at all in the latter. The majority of these specimens were from treated cases of syphilis.

Our observation on the relative value of these two tests is in accord with the results obtained in 1926 when Kahn, in coöperation with seven other serologists, tested a series of 252 specimens from persons who had been given careful clinical observation.

The routine Kahn proved slightly more sensitive than the complement-fixation test with the acetone-insoluble antigen in the examination of the series of 10,455 specimens. The majority of the disagreeing reactions, as with the cholesterolized antigen, occurred with serums from treated cases of syphilis.

As the routine Kahn test is slightly more sensitive than that with the noncholesterolized antigen, and entirely different reagents and apparatus are used in it, this precipitation test, or another of corresponding value, might furnish a more satisfactory control for the complement-fixation test with the cholesterolized antigen than does the one with the non-cholesterolized antigen.

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\* Abstract of Progress Report, presented to the Laboratory Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 1, 1929.



Kahn's presumptive precipitation procedure was compared with the routine Kahn procedure and with the complement-fixation test with the cholesterolized antigen in examining 1,668 specimens. The results indicate that the presumptive test, although more sensitive than the routine Kahn, is, nevertheless, not so sensitive as the complement-fixation test with which it was compared.

The results with the Kline slide test, Müller's Ballungsreaktion, and the Meinicke Klärungsreaktion were closely in accord with those obtained with the routine Kahn. Results with the Sachs-Georgi test indicated the procedure to be less sensitive than the others studied. The Meinicke Trübungsreaktion did not give satisfactory results in our hands. This may have been due to the use of inactive rather than active serums.

While the investigation made for the Committee on Standard Methods has demonstrated the superiority of the complement-fixation test over the precipitation tests studied, the results obtained with complement-fixation made during the League of Nations Conference in 1928 were, on the whole, much less satisfactory than those reported with the flocculation tests. The methods represented at the Conference, however, failed to incorporate certain procedures that have been found to insure accuracy of results. It may be judged, therefore, that less attention has been given during recent years to the development of the sensitivity of the complement-fixation test abroad than in this country. Not only was there failure to secure reactions with many specimens from cases of syphilis, but, with the exception of two procedures, definite reactions were obtained with specimens from persons without history or symptoms of syphilis. The results with the two methods of complement fixation which gave the most satisfactory reactions were comparable to those secured at the Conference with the Sachs-Georgi test, and were much less accurate than those obtained there with the Müller and Kahn precipitation tests. As the latter has been shown repeatedly to give fewer reactions with specimens from cases of syphilis than a sensitive complement-fixation test, one is forcibly impressed with the need for its standardization, with the incorporation of the procedures found to give the most satisfactory results. If it does not seem feasible at present to recommend for adoption any one method *in toto*, agreement on essentials might be secured.

RUTH GILBERT, M.D., *Referee*

## EDITORIAL SECTION

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### VENTILATION AND COMFORT

WITH the discovery of more fundamental facts—through the substitution of research investigation for opinion—and a study of the essential factors concerned in the problem of ventilation, progress in air conditioning and air distribution has been phenomenal. A logical standard of ventilation can be determined only by accurate measurements of human comfort and efficiency.

The belief advanced some sixty years ago that the object of ventilation was the removal by dilution with fresh air of organic poisons excreted into the atmosphere from human bodies, is of interest today only because this idea still exists in the minds of some of the laity. The investigations at Breslau, by Flügge and his associates, later confirmed by Hill and Haldane in England, and by Benedict and the New York State Commission on Ventilation in the United States, have shown that human occupancy is insufficient noticeably to change the chemical proportions of the constituents of air.

It is recognized that the most important factor in determining the fitness of air, in the absence of some contaminating source carrying harmful dusts, gases and disease producing organisms, is the maintenance of the physical conditions of the air which favor the normal loss of body heat. By the physical conditions of the air is meant its temperature, moisture content and rate of movement. This conception in its early stages led to overemphasis of one or another of these three physical factors as the most accurate index of comfort. The dry bulb temperature of the air, that is, the temperature indicated by an ordinary thermometer which measures the average effect or intensity of the heat, was assumed at first to be the all important

factor in determining one's feeling of comfort. A dry bulb temperature of  $70^{\circ}$  was offered as a standard. Later, the reverse was true, and a wet bulb temperature of  $56^{\circ}$  without reference to the other factors was favored as a more correct index. The wet bulb temperature can be determined from the ordinary thermometer by covering the bulb with a moistened wick, and passing air rapidly over it either by whirling or by means of a small fan. The reading of the thermometer indicates the degree of moistness of the air. Then followed the view that the dew point, or the temperature of the atmosphere at which the moisture begins to be deposited as dew, rather than the wet bulb, was more accurate.

The results of further investigations, principally those conducted jointly by the U. S. Bureau of Mines, the U. S. Public Health Service, and the Research Laboratory of the American Society of Heating and Ventilating Engineers, present evidence establishing the influence on human comfort of all three factors—dry bulb temperature, wet bulb temperature and air movement. This later study has demonstrated the physiological changes which take place in the body, and indicated the length of time human beings can tolerate the various combinations of these physical qualities of the air. Temperature conditions at which fans are desirable are indicated; also when fans will no longer mitigate the heat, and finally when an increase in air currents may even exaggerate the discomfort.

While no single instrument has yet been devised to indicate the comfort of a given atmospheric condition, the above study has developed a single index of expression, by means of what has been called the "effective temperature scale," for the degree of warmth experienced by individuals for equivalent atmospheric conditions. The effective temperature scale was established by experiments with human subjects, and measures the resultant effects of the dry bulb temperature, the wet bulb temperature and the velocity of air on the human senses. Within this scale a zone of comfort has been determined, thus indicating various combinations of the physical factors of air giving uniform feelings of comfort.

Our present knowledge of the problems of ventilation therefore seems to justify the acceptance, as a standard, of the following requirements: The attainment and maintenance of an atmospheric condition in every part of a room occupied by human beings that is free from an excess of dust, disease producing organisms, unpleasant odors and poisons, with suitable air movement, and at a temperature and humidity shown within the comfort zone between  $63^{\circ}$  and  $71^{\circ}$  F. effective temperature.

## A NEW USE FOR THE MALARIAL PARASITE

THE antagonisms which exist between certain diseases have been observed over a long period of time. We believe that the artificial inoculation with the malarial parasite in the treatment of late syphilis by Wagner-Jauregg was the first instance in which infection with one disease was used to cure another, though the attempted cure of certain tumors by inoculation with the streptococcus or its products is a matter of record.

The most recent development is the use of artificial infection with the malarial organism for the cure of gonorrhea. An observation made in Acre<sup>1</sup> tends to show that in Palestine cases of gonorrhea following a previous infection with malaria cleared up more quickly than usual. The high temperature in malarial attacks is credited with having a beneficial effect, and other similar instances have been recorded.

*The Lancet*<sup>2</sup> calls our attention to the fact that John Hunter a century ago observed "the suspension or cure of a gonorrhea by fevers." It is also stated that during the past five years several German practitioners have used malarial inoculation with success in the treatment of gonorrhea in adult females.

The average number of days in the hospital in cases of military gonorrhea is said to be 55.7 in England, 51.33 in India, and 46.7 in West Africa where the incidence of malaria is high. It is further stated in the report referred to that neurosyphilis is much more prevalent in tropical towns than in the villages of the same country, probably on account of the greater prevalence of malaria in the villages, approximately 70 per cent of the inhabitants being infected; whereas in the towns, preventive measures and drainage have cut down the incidence of the disease.

These reports are exceedingly interesting in themselves, but have an important bearing on the future health of tropical countries, since there seems to be there, as elsewhere, a drift of the inhabitants from the country to the cities.

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## THE DOCTOR'S INCOME AND PREVENTIVE MEDICINE

FROM time to time the question is raised as to what effect the extensive program of preventive medicine that is developing in many parts of the country will have on the income of the practicing physicians.

The falling death and morbidity rates in all parts of the country compel recognition of the fact that this question has other than academic significance. Thinking persons realize that the practice of medicine is no more a static condition than any other human relationship. In the evolution of social adjustments, the means and mechanism of furnishing necessary human service must be modified to meet changing conditions.

The shrewd horse trader long ago sold his livery stable and bought a garage. The physician of the kerosene era obtained a large part of his income from the treatment of diphtheria and infantile diarrhea. While preventive medicine has reduced the physician's income from both these sources almost to the vanishing point, the physician of the gasoline age has more practice of a far better kind.

The mathematical demonstration of this statement may be presented with available figures. The last year for which figures on diphtheria rates of the various states of this country are obtainable is 1927. In that year there were 82 cases of diphtheria reported in the State of Michigan for each 100,000 population. A comparison of incomes to the physicians between fees received for the treatment of cases and those paid for the immunization of babies reveals that even where the disease has the above unusual prevalence, preventive medicine is as productive financially as curative medicine. The income from treating 82 cases at \$50 each would be \$4,100. Among each 100,000 population in the State of Michigan in 1927, there were 2,200 babies born. If each of these babies had been immunized at only \$3 each, the income from this practice in 100,000 population would have been \$6,600.

It is also to be noted that these data predicate only the immunization of the new-born, or an equivalent number of persons in the community. There are of course four times as many preschool children as babies, and ten times as many school children. The opportunity for increasing practice by carrying on immunization among the preschool and school populations in the physician's clientele offers an almost unlimited field.



### VICTOR CLARENCE VAUGHAN

October 27, 1851 — November 21, 1929

THE death, on November 21, 1929, of Victor Clarence Vaughan, M.D., has deprived American medicine and public health of its foremost leader. He was born on October 27, 1851, at Mount Airy, Mo. From 1874 until his retirement in 1921 he was connected with the University of Michigan, first as student, then as teacher and dean, during which long period he achieved for himself a world-wide reputation as a teacher, scientist and epidemiologist.

Retirement from the University did not close his activities. For several years, as Chairman of the Medical Division of the National Research Council, he resided in Washington. It was there he wrote the two volumes of his splendid work, *Epidemiology and Public Health*. In 1926 he produced his autobiography, *A Doctor's Memories*. In the fall of that year, with Mrs. Vaughan, he went as delegate to the Medical Congress in the Orient, visiting China, Japan and

the Philippines. In the spring of 1927 he suffered an attack from which he never fully recovered.

For twenty years following his graduation Dr. Vaughan was engaged in active medical practice. Nevertheless, his interest always centered in laboratory work. From the beginning he was attracted to chemistry and the chemical viewpoint appeared prominently throughout his subsequent work. His first contribution on the separation of arsenic from other metals appeared in 1875. The action of poisons and their detection fascinated him to such an extent that before long his services were in demand as a medical expert and he became a recognized authority in toxicology.

It was but a step to become interested in sanitary matters. The question of the pollution of wells and water supplies arose, and a chemical examination at that early period was the only means of arriving at a decision. At this time Dr. Vaughan was called upon to investigate the not infrequent poisonings from cheese and other milk products. Though bacteriology was then in its infancy he soon realized that the poisonous products were in some way the result of bacterial action. He was among the first to teach that similar products could be the cause of cholera infantum, and that this disease was therefore due to the contamination of milk. Without fully realizing it, the sanitary chemical work was leading him into the new and broader field of modern bacteriology.

It was soon apparent that the old chemical laboratory was inadequate for pursuing problems pertaining to health and disease. His broad vision indicated the need of a separate institution. Accordingly he appeared before the Michigan Legislature of 1887 and secured an appropriation establishing the Hygienic Laboratory at the University. Some attempts were made in the old laboratory to apply the new science of bacteriology

to the solution of problems arising in the examination of waters, but it was seen that a thorough training in the new discipline was necessary. At that early period this could only be obtained in Germany. Accordingly, Dr. Vaughan spent the summer of 1888 in Koch's laboratory in Berlin, where, under the direction of Carl Fraenkel, knowledge of the new methods was acquired.

The laboratory building was completed in the fall of that year and opened in January, 1889. It was the first in this country which offered systematic teaching of bacteriology to physicians and students. For twenty years Dr. Vaughan was active as its Director. In 1903, he established there a Pasteur Institute. At that time the antirabic treatment could be obtained in but two or three places in the country.

Dr. Vaughan's investigations in the new laboratory covered many fields. At first, the examination of water supplies claimed much attention and he devised what he termed "the Michigan method" of analysis, which made use of the experimental animal as a means of detecting harmful bacteria. His studies on food poisonings were likewise extensive and thorough. He sought the explanation of the germicidal action of normal serum and found it in the complex chemical constituent nuclein. Even more important were his studies upon the nature of the bacterial poisons or toxins. He devised an ingenious "tank" method for growing pathogenic organisms in quantities in order to obtain a sufficient amount of the cells for the study of the bacterial proteins. By this means he was able to break up the proteins into two portions, one toxic and the other non-toxic. He utilized these results in formulating a valuable theory bearing upon the nature of hypersensitiveness and of fevers.

As an earnest and enthusiastic investigator Dr. Vaughan had few equals. His extraordinary capacity for writing found

expression in more than 200 publications, not including his more pretentious works, on Physiological Chemistry, Pto-maines and Leucomaines, Cellular Tox-ins, Protein Split Products, Infection and Immunity, and Epidemiology. As an editor he founded the *Physician and Surgeon*, the *Journal of Laboratory and Clinical Medicine*, and served as the first editor of *Hygeia*. During his 30 years of service on the Michigan State Board of Health he did much to spread the growing knowledge of sanitation and public health.

During the Spanish War, he saw active service at Santiago where he contracted yellow fever. Shortly after his recovery he was detailed, with Majors Walter Reed and E. O. Shakespeare, to investigate the disease which prevailed in the American camps. The classical report of the Typhoid Fever Commission was largely prepared by him as the sole surviving member. In the World War he again saw service, this time as a member of the Board in Charge of the Communicable Diseases.

Dr. Vaughan's valuable services brought him such well deserved recogni-

tion as the presidency of the American Medical Association, of the Association of American Physicians and of other societies. He was awarded the Distinguished Service Medal, Cross of the French Legion of Honor, and the Kober medal, besides various honorary degrees and memberships in learned societies.

It is as an instructive and inspiring teacher that Dr. Vaughan will be remembered by the thousands of students who had the opportunity and privilege of listening to him. He freely drew upon his experiences in life and made the lectures interesting and forcible by his masterly presentation.

Until his last illness Dr. Vaughan maintained a lively interest in the progress of science and of public health. While he was modest as to his own work he freely recognized merit in others. Personally he was a most lovable man, and his home overflowed with true southern hospitality. He loved his fellow men and gave freely of his time and energy. As a scientist and educator he was among the first. He left an enduring impress in both fields. A great leader, a constructive thinker and a broad idealist is gone.



## LETTERS TO THE EDITOR

TO THE EDITOR:

The presidential address of Dr. Nicoll, delivered before the State and Provincial Health Authorities of North America, recently published in your valuable journal, attributes a statement to me to which I desire to take exception.

In his excellent discussion on maternity as a public health problem I am quoted as stating that prenatal care and instruction is an "unessential problem" in the general scheme of securing better maternity care. Probably my personal views on this matter are of little interest to your readers, but I feel that in justice to the subject itself I must contradict the false impression which might be conveyed by Dr. Nicoll's remarks. The incident to which he refers occurred at a hearing on the proposed Newton Bill before a Congressional committee at which I appeared in opposition to this measure. In my argument I stated that prenatal care alone would not solve the problem of the comparatively high morbidity and mortality rates which attend childbirth in this country, but rather that the leading factor in their production was inadequate or poor care in delivery. I also stressed the fact that the Sheppard-Towner activities were centered largely in a multitude of prenatal observations, especially by visiting nurses, without sufficient weight being given to the need for proper attention during labor. Unfortunately the provisions of the Sheppard-Towner Act contribute to this situation.

Adequate prenatal care is not sufficient to improve the mortality from childbearing. A certain number of complications may thus be prevented, but sepsis, for example, which is one of the largest single factors in puerperal mortality, can be but little influenced

by prenatal care. Unfortunately a false sense of security has been developed in the minds of patients and others by the notion that prenatal care is all that is necessary, and provisions for safe delivery are in this way apt to be neglected; but this does not imply that prenatal care is a "non-essential problem," and such a point of view is entirely foreign to my opinion.

The so-called problem of better maternity care is not an easy one to solve and will require the combined thought and effort of the community, the medical and nursing professions, and the individual for its effective handling. Stress must not be laid too strongly on any one phase of the work, for thus a lack of balance and proportion results which is detrimental to any advance in this important field of medicine.

Aside from this misinterpretation of my testimony at the hearing on the Newton Bill, I want to commend the timely and valuable address of Dr. Nicoll, which constitutes another evidence of his deep interest in the problem of bettering the puerperal mortality figures of New York State.

GEORGE W. KOSMAK, M.D.,  
Editor, *American Journal of Obstetrics and Gynecology*

TO THE EDITOR:

On page 740 of the July issue of the JOURNAL there appeared an article entitled "Rating Your Milk Supply," by Leonard V. Phelps, in which the author (1) briefly outlined the system in use by the U. S. Public Health Service for computing the milk sanitation ratings of municipalities; (2) pointed out features of the formula for determining the General Municipal Milk Sanitation Ratings which in his opinion make it valueless and the results misleading; (3) sug-

gested a substitute formula for the calculation of the General Municipal Milk Sanitation Rating; and (4) presented a "graphical chart" based on his formula, by means of which General Municipal Milk Sanitation Ratings may easily and quickly be determined.

It has been the practice of the Office of Milk Investigations of the U. S. Public Health Service, in reporting survey results, to give the Retail Raw Milk, the Raw-to-Plant Milk, and the Pasteurization Process Ratings, as well as a General Municipal Milk Sanitation Rating, based upon the three afore-mentioned ratings and the percentage of the total milk supply which was pasteurized. It is the formula developed for the determination of this General Rating which Mr. Phelps criticised.

In deriving its formula for the General Municipal Milk Sanitation Rating I am advised by Mr. Frank that the U. S. Public Health Service proceeded on the assumption that the ideally safe milk supply is one to every quart of which every practicable precaution known to preventive medicine has been applied; that is, a supply every quart of which has been both properly produced and properly pasteurized.

Furthermore, the Service formula assumes that the pasteurization precautions are as important as the production precautions.

A rigid application of mathematics upon the basis of the above assumptions will yield the following formula, which is the U. S. Public Health Service formula criticised by Mr. Phelps:

$$\text{General Rating} = \frac{C \times A\% + D \times B\% + E \times B\%}{2}$$

Where: A = Gallons retail raw milk sold per day  
 B = Gallons pasteurized milk sold per day  
 C = Retail raw milk rating  
 D = Raw milk to plant rating  
 E = Pasteurization process rating  
 G. R. = General rating

Mr. Phelps charges that the foregoing formula yields misleading results, because variations in B, or the per cent of

milk pasteurized, vary the General Rating even though the *excellence* of production and pasteurization remains unchanged.

These variations in General Rating occasioned by variations in B per cent are all justified, in the light of the reasoning that a municipal milk supply approaches the ideal in safety in direct proportion to the percentage of it which is both ideally produced and properly pasteurized. In Mr. Phelps's examples in Table II the pasteurization process ratings are constant (80). It seems to the writer to be quite clear that either of the two supplies of which 80 per cent is pasteurized is safer, and quite logical that it should be rated higher than the supply with which it is compared.

In the third portion of his paper, Mr. Phelps presents his version of a formula for determining General Municipal Milk Sanitation Ratings. This is:

$$\text{G. R.} = \frac{A + \frac{B + C}{2}}{2}$$

Where: A = Raw-to-retail rating  
 B = Raw-to-plant rating  
 C = Plant process rating

$$\frac{B + C}{2} = \text{Combined rating}$$

G. R. = General rating

Nowhere in his paper does Mr. Phelps state that his formula is designed to be used only for determining the ratings in communities in which some portion of the milk is pasteurized. It is logical to assume, therefore, that it can be used to determine general ratings in communities having only retail raw milk supplies, as is frequently the case in small communities.

Suppose, then, the Retail Raw Milk Rating of such a community's supply be 90. The General Rating, according to the Phelps formula, is:

$$\frac{90 + \frac{0 + 0}{2}}{2} = 45$$

This is identical with the result obtained by the use of the U. S. Pub-

lic Health Service formula. It seems, then, that Mr. Phelps has added nothing of value to our machinery for obtaining the G. R. in communities entirely dependent upon raw milk supplies.

Suppose, however, that 5 per cent of the supply (20 gallons of a total supply of 400 gallons—an actual case in an Alabama community) were pasteurized, and that the Raw-to-Plant and Plant Process ratings were those given in Mr. Phelps's examples—80 and 80 respectively. The General Rating of this community supply would then be:

$$\frac{90 + \frac{80 + 80}{2}}{2} = 85$$

According to Mr. Phelps's conception the whole community milk supply is nearly twice as safe because 5 per cent of it is pasteurized! This does not seem logical.

According to the U. S. Public Health Service formula, the General Rating of this community supply would be:

$$\frac{90 \times .95 + 60 \times .05 + 80 \times .05}{2} = 46.75$$

This slight increase in General Rating appears to be a far more logical result of the pasteurization (somewhat imperfectly) of only 5 per cent of the total municipal milk supply.

Assuming, however, that Mr. Phelps intended his general formula to apply only to cities in which at least some pasteurized milk is sold, it is nevertheless mathematically faulty, as is shown by the following examples, in which the volume of milk and the A-B-C ratings are constant, but the percentages of milk sold raw and pasteurized are reversed.

City A consumes 10,000 gallons of milk per day, of which 9,900 gallons is pasteurized, with B and C ratings of 80 each. The other 100 gallons are raw milk of low quality and high bacterial count, with an A rating of 50, a situation frequently found where pasteurization is not compulsory.

City B consumes 10,000 gallons of milk per day, of which only 100 gallons are pasteurized, with B and C ratings of 80 each. The other 9,900 gallons are raw milk of low quality and high bacterial count, with an A rating of 50, a situation not infrequently found, wherein one small plant is trying to introduce pasteurized milk.

Obviously in City A 99 per cent of the milk is moderately safe, whereas in City B 99 per cent of the milk supply is 50 per cent unsatisfactory. Yet the Phelps formula would give both cities the same General Rating, namely, 65.

The U. S. Public Health Service formula, however, would give City A a General Rating of 79.45, and City B a General Rating of only 25.55. These are obviously reasonable ratings in view of the contrasting circumstances, and illustrate the utter necessity of including the percentage of milk pasteurized in the formula.

If the foregoing reasoning is correct, the conclusions of Mr. Phelps are unfounded, and his objections and proposed substitute are unsound.

C. A. ABELE,  
Director of Inspection  
State Board of Health  
Montgomery, Ala.

#### TO THE EDITOR:

The U. S. Public Health Service has issued a statement concerning the General Rating, which is derived from the use of their formula, "that a 100 per cent General Rating means that all of the community's milk supply has been both properly produced and properly pasteurized." It would seem logical then to assume that a milk supply having a G. R. higher than another would be one that was better produced and better pasteurized. But this is not the case. Table II, page 743 of the July issue of the JOURNAL, shows an example in which a milk supply may either be produced or pasteurized one-half as well

as another and still receive a higher G. R., simply by increasing the percentage of the total milk supply pasteurized. My critic attempts to justify this by stating that a milk supply approaches the ideal in safety in direct proportion to the percentage of it which is both ideally produced and properly pasteurized, and that a higher rating should be given that having the larger percentage pasteurized. However, this statement does not deny the fact that the G. R. does not show the excellence of production or pasteurization.

I did not undertake to discuss in my article what constitutes the ideal milk supply, but merely what I considered defective in the U. S. Public Health Service formula.

My critic's statements would lead one to believe that it was not intended that the federal G. R. should show how properly the milk had been produced or pasteurized, but rather the "safety" of the supply, the safety being dependent upon the degree of excellence with which the milk had been both produced and pasteurized, and what percentage of the supply had been pasteurized.

When a rating stresses a particular subject, it is no longer a general rating. I did not state that a special rating, in which pasteurization was stressed, should not give added credit for increases in the percentage of the supply pasteurized. My contention was that pasteurization should not be stressed in a general rating formula, and especially when the stressing of it makes it impossible to determine from the G. R. the excellence of production and pasteurization, and the manner in which a community has complied with the dairy regulations as given in the Standard Milk Ordinance.

Assuming that the federal G. R., as my critic has implied, was intended to show the safety of a community's milk supply, and not how properly it had been produced or pasteurized, it can

easily be shown that in many instances it does not show safety. One G. R. higher than another does not necessarily indicate a safer supply.

For example, in Table II, an A-B-C score of 80-60-80 where 20 per cent of the supply was pasteurized gave a G. R. of 46.0, while another 40-30-80 when 80 per cent of the supply was pasteurized gave a G. R. of 48.0. While the latter supply had a higher G. R. than the former, because of the higher percentage of milk pasteurized, the raw milk going to the plant was of such a poor quality that pasteurizing would not change it into a good milk, nor would it compensate for its improper production.

To pasteurize a poorly produced milk will not make it safe, and to pasteurize improperly a properly produced milk is much worse than not pasteurizing it at all.

Since, in the federal formula, production of milk going to the plant and pasteurization are given equal weight, it would seem that the same G. R. would have resulted had the production to plant score been constant at 80 in both cases, and the pasteurization process been rated 60 and 30 respectively. A raw milk properly produced is safer than one improperly pasteurized.

Just what score would indicate improper production or improper pasteurization, may be a matter of opinion, but certainly no one will deny that a score of 30 or less would do so.

It might be logically assumed, providing my critic's implied interpretation of the intended meaning of the federal G. R. is correct, that two milk supplies having equal general ratings were equally safe. Such is not the case.

TABLE A

Milk Supply	A-B-C Score	Per cent	Per cent	General Rating
		Milk Pasteurized	Milk Raw	
I	80-75-30	90	10	51.25
II	80-75-80	30	70	51.25
III	80-70-20	90	10	44.5
IV	80-70-80	14	86	44.9

A supply with an A-B-C score of

80-75-30 would give a G. R. of 51.25 when 90 per cent of the milk was pasteurized, while another having a corresponding score of 80-75-80 and 30 per cent pasteurized would also have a G. R. of 51.25. Both supplies are produced equally well, but the first is improperly pasteurized, yet it is accorded a G. R. equal to that of the second simply because 60 per cent more of the supply is pasteurized.

It cannot be reasoned that the two supplies are equally safe, yet the federal formula gives them equal ratings, indicating that they are equally safe. A second example of this type may be seen in Table A under supplies III and IV, in which the general ratings are almost equal. Since values for B and C in the A-B-C score may be interchanged without affecting the G. R., it can be seen that both of these examples might have had improperly produced supplies instead of ones that were improperly pasteurized.

I suggested in my article the following formula which would show how well a community was complying with the regulations of the ordinance:

$$\text{G. R.} = \frac{A + \frac{B + C}{2}}{2}$$

Where: A = Retail raw rating  
 B = Raw-to-plant rating  
 C = Pasteurization process rating  
 G. R. = General rating

While it is true that I did not state that the suggested formula was designed to be used only in communities in which some portion of the milk was pasteurized, the context of my article made it

the only logical conclusion. Twice on page 746, and at least once on page 743, of the July issue of the JOURNAL, it was plainly stated that it was my opinion that the G. R. should show compliance with dairy regulations, and only that. Obviously a supply in which none of the milk was pasteurized would have a G. R. identically the same as the retail raw score.

Nowhere did I state that my formula would give a G. R. showing "safety" of the milk supply. My critic's assumptions and examples are therefore irrelevant and will not be discussed.

I suggested a formula which would show in the G. R. compliance with regulations as given in the Standard Milk Ordinance, and that only, not because a formula capable of producing a special rating showing the safety of the milk supply would not be desirable. I did not intend to imply that a formula designed to show safety of the supply should not give added scoring to supplies showing a larger percentage of milk pasteurized than another, providing that the supplies had both been properly produced and properly pasteurized.

I have shown that the federal formula does not give a G. R. which shows how properly a milk supply has been both produced and pasteurized, neither does it show "safety" of the milk supply, nor to what degree a community is complying with the regulations of the Standard Milk Ordinance.

LEONARD V. PHELPS,  
 City Bacteriologist and Chemist,  
 Bluefield, W. Va.

# ASSOCIATION NEWS

## 1929 ANNUAL MEETING PROCEEDINGS

THE 58th Annual Meeting of the American Public Health Association is a milestone in the progress of this organization. Several important changes in the Constitution and By-laws were adopted in accordance with recommendations of the Committee on Revision of the Constitution and By-laws and the Committee on Coöperation, Development and Finance, after an exhaustive study of the activities, policies, and future opportunities of the Association. The reports of officers and committees were constructive and indicative of progress.

The program arranged by the Central Program Committee included 47 sessions and 180 papers, exclusive of the programs of twelve related organizations which also met in Minneapolis at the same time. The annual meeting registration numbered 795 members and 569 guests. Special representatives were present from China, Hawaii, and the Philippine Islands. An unusually full program of general and section meetings attracted large audiences. The educational exhibits and demonstrations were in general considered to be above the average.

### EXECUTIVE BOARD

The Executive Board consisting of 10 members held a busy session when reports were received from the officers and 9 major committees.

The Committee on Exhibits reported an income of \$16,000 from Annual Meeting exhibits. Seven commercial exhibits were not accepted.

Requirements for affiliated societies were discussed by the Executive Board, but were referred to the incoming board for further consideration.

The Treasurer's report showed a more healthy financial status than in several previous years. According to the auditor's statement as of August 31, 1929, the net worth of surplus of the American Public Health Association was \$26,747.85, with total assets of \$58,127.92 and total liabilities of \$31,380.07. The Executive Secretary's report will be reviewed in subsequent paragraphs.

### GOVERNING COUNCIL

The Governing Council held four meetings, in addition to a brief meeting of the incoming council, with gratifying attendance at each meeting of from 38 to 50, including section officers and representatives of affiliated societies averaging 43 Fellows.

The business of outstanding importance related to amendments to the Constitution and By-laws. These amendments will soon be published in detail in the JOURNAL. One of the principal changes in the Constitution provides that the officers of the Association shall be a President, a President-elect, three Vice-Presidents, an Executive Secretary, a Treasurer, and the Chairman of the Executive Board. The addition of the offices of President-elect and Chairman of the Executive Board should aid in long term planning and strengthen the administration of Association affairs. The officers, with the exception of the Chairman of the Executive Board and the Executive Secretary, are elected by written ballot of the Governing Council, while the Chairman of the Executive Board and the Executive Secretary are elected by the Executive Board, which board defines the duties and authority of these respective offices. The amendments also provide that at

the annual meeting the Governing Council shall determine in general outline the allocation of association moneys in the budget, and shall receive from the Executive Board a definitely formulated statement of a program of the major activities proposed for the ensuing year.

One of the important amendments to the By-laws provides for four standing committees of the Association in place of a large and indefinite number as previously. These committees are as follows:

Committee on Fellowship and Membership  
Committee on Meetings and Publications  
Committee on Administrative Practice  
Committee on Research and Standards

Certain problems of the Association may be handled through sub-committees or section committees. Section Councils and officers remain essentially as before, but it is provided that sections submit annually to the Governing Council through the Executive Board a report of the transactions of the section during the past year, and of the plans, scope and policy for the succeeding year—as well as advise with respect to the appointment of technical committees, sub-committees or section representatives on committees of the Association.

During the meetings of the council, 57 applications for Fellowship and 30 applications for Life Membership were approved. The report of the Committee on Resolutions has already been published in the JOURNAL.

#### ASSOCIATION COMMITTEE REPORTS

##### ADMINISTRATIVE PRACTICE

The past year has been one of great activity for the Committee on Administrative Practice, continuing its work of collecting and analyzing material relating to the administration of public health work. Its sub-committees have issued progress and final reports which have been received with keen interest.

*The Sub-Committee on Record Forms* has issued for experimental use, in line

with its adopted policy, a complete set of tuberculosis clinic records. The publication of these was made possible through coöperation and financing in part by the National Tuberculosis Association.

A second school health examination form, to be used in those communities providing for medical examinations, has been prepared by the committee and presented to the public by publication in the *American Journal of Public Health*.

*The Sub-Committee on Model Health Ordinances* has presented its first progress report, which lists the minimum requirements for local health laws and will serve as a guide to the formulation of the basic laws applicable to county, district and municipal health organization and practice.

*The Sub-Committee on Organized Care of the Sick*, which it will be remembered has representatives from both the public health group and the hospital group, has continued its consideration of this important question, and has published in the JOURNAL,\* a thought-provoking list of questions covering "What Public Health People Should Know about Hospitals and Clinics in Their Community." The committee is at present engaged in a detailed study of the Care of Communicable Diseases in General Hospitals. A preliminary report of this study was made two years ago, which developed considerable interest both in the public health and the hospital fields. The present study is to show in some detail the advantages and difficulties of caring for communicable diseases in general hospital plants.

Under the direction of the *Sub-Committee on Appraisal of City Health Work*, the *Appraisal Form for City Health Work*, revised last year, has been distributed and put into actual practice beginning January 1, 1929. Its reception has been even more favorable than previous editions. Local health officers

\* Apr., 1929, p. 397.

are expressing their approval of the many improvements made in the objectivity of the subject matter. There are, however, a number of items which are still subject to change.

The American Social Hygiene Association has published with descriptive comments the section of the Form dealing with Venereal Diseases, to stimulate greater interest among constituent members and others interested in the service.

The National Tuberculosis Association recently reprinted those items which deal directly with tuberculosis services and the related activities which frequently form a part of the program of local tuberculosis associations.

The National Committee for Mental Hygiene is distributing for experimental use the section dealing with Mental Hygiene services, prepared at the time of the last revision of the *Appraisal Form*, but not a part of the printed form.

The study of rural health work, undertaken last year on a grant from the Commonwealth Fund, has been continued under the *Sub-Committee on the Appraisal of Rural Health Work*. Up to the end of May, 1929, 15 counties in 9 states had been studied, covering a wide range of organization of state and local services, geography, climate and topography, and population.

As reported a year ago, studies of state health departments were carried on and reports prepared at the request of three state commissioners of health. The studies of last year have been condensed and will be printed by the Publication Division of the Commonwealth Fund, with the permission of the health officers concerned. This publication will be available for state health administrators, students and others interested in public health work.

*The Sub-Committee on Health Department Reports* has continued its activity, working out in tabular form and content the statistical tables recommended for inclusion in annual reports.

The adoption of recommendations\* of this committee by health departments throughout the country would insure more satisfactory statistical material than is now available.

Since the last meeting the plan for the Health Conservation Contest, to be conducted under the auspices of the Chamber of Commerce of the United States, has been developed and the contest launched. The details of the plan and the schedule for grading cities entered in the contest have been discussed with three groups of health officer representatives, western, eastern and central divisions. The representatives in each group were selected by the members of the Health Officers Section of the Association.

*The Sub-Committee on Public Health Nursing* is focusing its attention on: (1) the possibility of having some qualitative as well as quantitative measure of nursing service, (2) gathering material relative to the merits or demerits of the various systems of administering school nursing, and (3) material relative to the function and the administration of public health nursing in state departments of health.

The program of *Coöperation with the General Federation of Women's Clubs* carried on for the past three years has received considerable attention during 1929, with profit, we believe, both to the Association and to the Federation.

The Field Director was made a member of the Advisory Board to the Division of Public Health, Child Welfare and Community Service of the Public Welfare Department of the Federation, and has assisted in the planning of a health program covering community studies, health institutes, and general education in the field of maternal hygiene.

The *Field Service* of the Committee on Administrative Practice has been

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\* See page 34, this issue, for Report.



continued along the lines which have become fairly well crystallized, that is, rendering service to cities or communities approximately at cost. The communities studied so far this year are:

<i>Counties</i>	<i>Cities</i>
Pitt Co., N. C.	Fargo, N. D.
Clarke Co., Ga.	Quincy, Mass.
Rutherford Co., Tenn.	Providence, R. I.
Cattaraugus Co., N. Y.	Honolulu, Hawaii
Marion Co., Ore.	Milton, Mass.
	Nashville, Tenn.

In Providence and Honolulu certain aspects of hospital problems and the care of the sick were included in the study. The cities of the Demonstration Areas have been included at the request of the Commonwealth Fund and the Milbank Memorial Fund, as a part of their service to these communities. Pitt County, which was as already stated studied as a prize award, is the only survey which was not paid for by the community or an interested agency.

#### CHAUTAUQUA HEALTH PROGRAM

The Chautauqua Health Program Committee reported a very successful season, with many practical results. In 85 towns of 10 states, the health lecture of the Chicago Seven-Day Redpath circuit reached 72,700 people. In addition, 2,150 people were reached in two other communities through two independent Chautauqua programs. The number of addresses, outside of professional engagements, which the lecturer gave before luncheon and civic clubs and church congregations, would increase the number of his hearers several hundred more.

In any consideration of the health program, the children's Chautauqua must not be disregarded. Its program was given on the afternoon following the health lecture and it attracted fully as many people, particularly parents and relatives, as the evening lecture.

A full-time health Chautauqua director visited the capitals of the states on

the circuit, obtained the hearty cooperation of the state health officers and investigated conditions in the Chautauqua towns previous to the lecture. These activities proved most fruitful in providing the lecturer with advance information regarding problems to be stressed or work to be featured. The Tennessee State Health Department sent out a prospectus of the plan and a request for relevant information to health officials and civic minded persons in towns under its jurisdiction. This was a valuable preliminary. It established the status of the program and led to an intelligent understanding of it. The Kentucky Board of Health gave a summary of health conditions in each town and the points to be emphasized. The Indiana State Health Department sent a representative to the towns about two weeks before Chautauqua arrived.

When such solid and practical information concerning the policies of the State Health Department, as well as particular local health problems from the state's viewpoint, had been obtained by the director, a personal visit was made by him to each place where such was advised. In Georgia 5 towns were visited; in South Carolina 8; in North Carolina 7; in Tennessee 12; in Kentucky 14. These calls always resulted in a much better understanding of local health matters than could be gotten in any other way. It is felt that individualizing the lecture to the locality gave it a force and practical interest that added tremendously to its value.

E. L. Bishop, M.D., Commissioner of Health, State of Tennessee, after recounting in detail the stimulating effect on the public health movement in his state directly due to the Chautauqua Health Program, summarized as follows:

In our state the program was largely instrumental in bringing about the establishment immediately of two county health departments, the quite probable establishment of two additional departments and the possible

establishment of still another county health department. Mr. Snyder's visit to Tennessee was one of the most worthwhile educational projects and bore more substantial fruit than any other single project it has been our good fortune to have.

In addition to the above committees, progress reports were made on *Census of Public Health Workers*, *Federal Health Legislation*, and *Dairy Products*. The report of the *Committee on Annual Meetings*, recommending Fort Worth as the next meeting place, received favorable action. Attention was called to the necessity for vigorous section activity in developing a successful annual meeting, and the Executive Board was requested to consider the provision of a moderate budget for each section to aid in the work.

#### EDITORIAL COMMITTEE

Readers of the JOURNAL may be interested to note the increasing appreciation shown in the magazine by subscribers as well as by members. The average monthly paid circulation of the JOURNAL for the 12 months ending August 31 was 5,624 copies compared with 4,817 copies for the same previous period.

JOURNAL management is to provide each month articles sufficient in number and in length to satisfy all the interests in the Association and still keep within the budget. The only solution to this problem is more short articles.

At the beginning of the year the policy was adopted of promoting the demand for reprints from the JOURNAL, believing that this would give the material wider circulation and increase interest in the JOURNAL. This has resulted in orders for reprints of 60 articles from the January to August, 1929, issues and total sales of 144,275 reprints.

The outstanding need of the JOURNAL is for a larger budget. In spite of the fact that the present arrangement of a part-time editor is working satisfactorily, the importance of the JOURNAL in the Association's affairs merits full-time editorial service. The report of the Managing Editor shows that the JOURNAL is more than paying its way and the Editorial Committee believes that a greater share of the profits should be put into the JOURNAL. There is need not only for more editorial service, but also for a larger JOURNAL. Less than

AVERAGE MONTHLY CIRCULATION (PAID AND FREE)  
FOR EACH YEAR ENDING AUGUST 31

	Members	Subscriptions	Free	Total
1924	3,016	787	87	3,890
1925	3,095	842	108	4,045
1926	3,189	947	129	4,265
1927	3,392	1,045	132	4,569
1928	3,562	1,255	166	4,983
1929	3,952	1,672	199	5,823

The income from advertising for the 12 months ending August 31, 1929, was \$25,078.07, compared with \$13,378.04 for the previous year. This increase, accomplished without an increase in advertising rate, is in part due to the taking over of the business of *The Nation's Health*.

One of the most difficult problems of

35 per cent of the 199 papers and reports presented at the Chicago meeting were published. This low figure is due in part to the unusually large program at that meeting, but the figures for 1926 and 1927 were 44 per cent and 42 per cent respectively. Roughly two-thirds of the JOURNAL during the year is given to Annual Meeting papers and Associa-

## DISTRIBUTION OF MEMBERS AND FELLOWS IN THE SECTIONS—SEPTEMBER 1, 1929

Section	Total Member- ship in Each Section	No. of Fellows	Per cent of Total Fellows	No. of Active Members	Per Cent of Total Active Members
Health Officers	411	168	22.9	243	7.7
Laboratory	380	130	17.7	250	7.9
Vital Statistics	80	35	4.8	45	1.4
Public Health Engineering	268	109	14.8	159	5.1
Industrial Hygiene	126	39	5.3	87	2.8
Food, Drugs and Nutrition	129	33	4.5	96	3.0
Child Hygiene	211	64	8.7	147	4.7
Public Health Education	247	34	4.6	213	6.8
Public Health Nursing	244	29	3.9	215	6.8
Epidemiology	8	7	1.0	1	0
Unaffiliated	1,785	87	11.8	1,698	53.8
Total	3,889	735	100.0	3,154	100.0
Add	56 for Sustaining Members, Affiliated Societies and Honorary Fellows				
Total Membership	3,945				

tion reports. To raise this figure materially would further reduce the space now available for timely contributed articles.

## EXECUTIVE SECRETARY'S REPORT

Reference has previously been made to the financial status of the Association as shown in the Treasurer's report. An income for the fiscal year 1929 of \$117,348, an expense of \$104,881, and a net gain of \$12,467, compares with an income of \$31,187, an expense of \$29,566, and a net gain of \$1,621 in 1924.

Proportionally the income from membership dues, sales of publications, advertising and such basic sources is steadily decreasing. Actually the income from these sources in 1928 was three times as great as it was in 1923. Seventy per cent of the Association's total income in 1928 was from these sources as compared with 95 per cent in 1924. The income from grants is as rapidly increasing, representing 5 per cent in 1924 and 30 per cent in 1928. The proportion will be still higher in 1929. This changing basis of income

## MEMBERSHIP OF AFFILIATED SOCIETIES AS REPORTED BY THEIR SECRETARIES

Year of Affiliation		Affiliated Members	Members who are also Members of A. P. H. A.	Total Members of Society
1928	Connecticut Public Health Association	46	47	93
1925	Massachusetts Assn. of Boards of Health	83	63	146
1922	Michigan Public Health Association	164	160	324
1928	Missouri Public Health Association	74	87	161
1923	New Jersey Public Health Association	133	70	203
1925	New Mexico Public Health Association	31	6	37
1927	Northern California Public Health Assn.	74	65	139
1927	Ohio Society of Sanitarians	64	222	286
1925	Pennsylvania Public Health Association	140	87	227
1927	Southern California Public Health Assn.	515	80	595
1928	South Carolina Public Health Assn.	78	33	111
1925	Texas Association of Sanitarians	115	65	180
1925	Virginia Public Health Association	87	63	150
1926	West Virginia Public Health Assn.	36	40	76
Total		1,640	1,088	2,728

## SESSIONS, PAPERS AND REPORTS AT ANNUAL MEETINGS

Year	Total Number of Sessions	Number of Papers and Reports	Average No. of Papers per Session	Per Cent Published in Journal
1924	28	120	4.3	65.6
1925	29	128	4.4	57.9
1926	34	146	4.3	44.2
1927	34	155	4.6	41.9
1928	47	199	4.2	34.2
1929	47	180	3.8	—

## REGISTRATION OF MEMBERS AND GUESTS

Year	City	Total Registration	Number of Members	Number of Guests	Per Cent Guests	Per Cent of Members of the Association Registered at Meeting
1924	Detroit	894	517	377	43	16
1925	St. Louis	876	528	348	46	16
1926	Buffalo	1474	821	653	45	25
1927	Cincinnati	1158	795	363	31	23
1928	Chicago	2577	1057	1520	59	28
1929	Minneapolis	1364	795	569	42	20

must be recognized in the future planning of the Association.

*Membership*—On September 1, 1929, there were 3,945 members of all classes in good standing as against 3,735 on September 1, 1928. This represents a gain of 645 new members and a loss of 435, making a net gain of 210 for the previous 12-month period.

*Affiliated Societies*—There are at present 14 affiliated societies, 3 having been affiliated at the last Annual Meeting. One application (Georgia) is awaiting action at this meeting.

In addition to supplying reprints and copies of its own publications, the Association has continued its *Book Service*, supplying information on public health books to members and facilitating the purchase of health books by the members.

*Syndicated Public Health Bulletin*—The subscription rates were increased in January approximately 25 per cent, with no loss in subscribers. There has been a very insistent but small demand for this service.

*Annual Meeting*—It is a common observation that Annual Meetings are growing in size and complexity. The growing complexity is in a large measure due to the increasing number of smaller organizations meeting with us. The financing of meetings is becoming a large problem. A special memorandum on this subject to the Executive Board was considered.

Last year the Executive Board decided to give up the policy of looking to Annual Meeting cities to carry a major portion of the costs of Annual Meetings, and to adopt the policy of financing

## INCOME FROM ANNUAL MEETINGS

City	Year	From Exhibits	No. Booths Sold	From Local Committee	Total
Detroit	1924	\$2,964.50	26	\$4,621.38	\$7,585.88
St. Louis	1925	2,319.75	30	6,000.00	8,319.75
Buffalo	1926	4,358.46	33	3,500.00	7,858.46
Cincinnati	1927	7,610.00	33	00.00	7,610.00
Chicago	1928	20,254.85	91	744.24	20,999.09
Minneapolis	1929	14,260.00	65	00.00	14,260.00 (to Aug. 31)

meetings out of the sale of exhibit space and other income. In Chicago considerable progress was made in this direction, and this year the Association will carry its full share of annual meeting expense.

*Chautauqua*—In addition to its usual administrative duties the Executive Office has administered the Chautauqua program carried on again this year through a grant of \$15,000 from the Milbank Memorial Fund. One field worker has been employed for this service and the report on this project has been presented by the Chautauqua Health Program Committee.

*Field and Organization Contacts*—A curtailed staff, a decreased budget and administrative problems have limited the field and organization contacts of

the Executive Secretary. He has, however, represented the Association on the Executive Committee of the National Health Council, on the Board of Directors of the Joint Vocational Bureau, at the Conference on Public Health of the American Medical Association, and on the Board of Directors of the American Association for the Advancement of Science.

This report would be incomplete if it did not also record the fact that the Executive Secretary's office has given much assistance during the year to the work of several Association committees, especially the *Committee on Coöperation, Development and Finance*, and if it did not acknowledge particularly with deep appreciation the invaluable assistance of a devoted staff.

## NEW MEMBERS

- J. A. Baker, M.D., Middlebourne, W. Va.,  
County Health Officer
- Dr. Harvey Bartle, Philadelphia, Pa., Chief  
Medical Examiner, Pennsylvania Railroad  
Co.
- Gordon Bates, M.D., Toronto, Ont., General  
Secretary, Canadian Social Hygiene Council
- A. L. Bavone, Bismarck, N. D., Director, Bu-  
reau of Sanitary Engineering
- Eva L. Birkhead, Clay, W. Va., County Pub-  
lic Health Nurse
- A. Edward Bostrom, M.D., Waubay, S. D.,  
Epidemiologist, Board of Health
- Margaret L. Bronson, M.D., New Haven,  
Conn. (Assoc.)
- Helen A. Cary, M.D., Portland, Ore., Director,  
City Public School Health Dept.
- T. E. Cato, M.D., Glenville, W. Va., County  
Health Officer
- Virgil A. Deason, M.D., Logan, W. Va.,  
County Health Officer
- William H. Doolittle, Chicago, Ill. (Assoc.)
- Kendall Emerson, M.D., New York, N. Y.,  
Managing Director, National Tuberculosis  
Association
- Arthur A. Fleisher, Philadelphia, Pa., Presi-  
dent, Jewish Hospital Association (Assoc.)
- Sadye L. Hatcher, R.N., Henderson, N. C.,  
County and City Nurse
- Bertha B. Hayes, Detroit, Mich., Nutrition  
Director, Detroit Dairy and Food Council
- R. D. Higgins, M.D., Ashland, Ky., Director  
of Public Health
- Edwin E. Hubbard, M.D., Dearborn, Mich.,  
Director, Medical School Service
- Hughes B. Jenkins, M.D., Sandersville, Ga.,  
Health Commissioner, Washington County
- Ellsworth Johnson, M.D., Windom, Minn.,  
County Health Officer, Cottonwood County
- Helen R. Katen, Bismarck, N. D., Executive  
Secretary, N. D. Tuberculosis Association
- Alberto G. Laurel, Sc.B., Manila, P. I., Field  
Director and Bacteriologist, Division of  
Malaria Control
- Anthony J. Lorenz, Chicago, Ill., Research  
Consultant, Quaker Oats Co. (Assoc.)
- Olive McGinnes, R.N., San Francisco, Calif.,  
Supervisor of School Nurses
- Mary J. McGovern, R.N., Saginaw, Mich.,  
Supervisor of Nurses, Dept. of Health
- James R. Matthews, B.Sc., Niagara Falls,  
Can., Personnel and Industrial Relations  
Worker (Assoc.)
- Fred B. Messing, D.P.E., Portland, Ore., Ex-  
ecutive Secretary, Oregon Social Hygiene  
Association
- Carl S. Miner, B.S., Chicago, Ill. (Assoc.)
- Allen F. Murphy, M.D., Beckley, W. Va.,  
County Health Officer
- John T. Myers, M.D., Omaha, Nebr. (Assoc.)

J. J. Nichols, New York, N. Y. (Assoc.)  
 Richard J. O'Brien, M.D., Rosebud, S. D.,  
 Supt., Tod County Bd. of Health  
 John O. Polak, M.D., Brooklyn, N. Y., Teach-  
 ing obstetrics and gynecology (Assoc.)  
 Daniel L. Seckinger, M.D., Savannah, Ga.,  
 Deputy Commissioner of Health  
 Mack M. Shafer, Dayton, O., Industrial Phy-  
 sician, Frigidaire Corporation  
 Belle Sherwin, B.S., Washington, D. C.  
 (Assoc.)  
 Orville Simmons, Kell, Ill., Assistant Director  
 of Physical Education (Assoc.)  
 Gertrude R. Smith, Brooklyn, N. Y., Assistant  
 Director, Brooklyn Visiting Nurse Associa-  
 tion  
 E. Lorene Standish, Waterloo, Ia., Visiting  
 Nurse, Social Welfare League  
 Trent Stout, M.D., Pierre, S. D., Supt.,  
 Hughes County Board of Health  
 Fred E. Stuart, Daytona Beach, Fla., Bac-  
 teriologist and Chemist, Water Works Lab-  
 oratory  
 W. W. Towne, Waubay, S. D., Sanitary Engi-  
 neer, State Board of Health  
 Frank L. Woodward, B.E., Minneapolis,  
 Minn., Associate Sanitary Engineer, Dept.  
 of Health

## DECEASED MEMBERS

P. H. Brigham, M.D., Florence, S. C., Elected  
 Member 1926  
 Pearl M. Hall, M.D., Al-gwah-ching, Minn.,  
 Elected Member 1908  
 M. J. Ragland, D.V.M., Salisbury, N. C.,  
 Elected Member 1925  
 F. M. Smersh, M.D., Owatonna, Minn.,  
 Elected Member 1899  
 Victor C. Vaughan, M.D., Richmond, Va.,  
 Elected Member 1918, Fellow 1925, Hon-  
 orary Fellow 1926  
 Hazel D. Bonness, M.D., Stillwater, Minn.,  
 Elected Member 1923, Fellow 1926  
 R. W. Corwin, M.D., Pueblo, Colo., Elected  
 Member 1913, Fellow 1922  
 Frederick R. Green, M.D., Chicago, Ill.,  
 Elected Member 1915, Fellow 1922  
 W. C. Sieker, Milwaukee, Wis., Elected Mem-  
 ber 1918  
 Robert M. Burnett, Southboro, Mass., Elected  
 Member 1919  
 Boris D. Bogen, Cincinnati, O., Elected Mem-  
 ber 1927  
 Lucien Howe, M.D., Cambridge, Mass.,  
 Elected Member 1926  
 Anna M. McGee, R.N., Schenectady, N. Y.,  
 Elected Member 1926

## INTERNATIONAL HYGIENE EXHIBITION

There will be held in the city of Dresden, Germany, from May to October, 1930, an International Hygiene Exhibition, sponsored by the Deutsches Hygiene-Museum. The opening of this exhibition will also mark the dedication of the new building for the Deutsches Hygiene-Museum.

It will be recalled that this is the organization which was responsible for the exceedingly interesting educational hygiene exhibit shown in Dusseldorf and in other European cities in 1926.

Many European countries have al-

ready reserved space in this exhibition, and Dr. Arthur Schlossman of Dusseldorf, a member of the Board of Directors of the Deutsches Hygiene-Museum, has just visited America where he has discussed with a number of national health organizations, official and unofficial, the possibility of an American exhibit in the exhibition.

Further information concerning the proposed exhibition can be secured by addressing the Managing Editor of the *American Journal of Public Health* and *The Nation's Health*.

# PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

**Full-time Health Protection—**  
Concrete evidence that fewer mothers and infants die among those reached by full-time modern health service will be found in figures recently compiled for the Child Health Demonstrations of the Commonwealth Fund:

During the 4-year period covered by this special study there were 10,444 births in the four demonstration communities. In 2,518 cases, about one-fourth

month in comparison with 297 in the group not served.

The comparative mortality and still-birth rates are given in Table I.

In these four communities 6,234 infants between 1 month and 1 year of age had either field nursing service or medical supervision in health centers, or both, while 3,425 infants did not have such care. There were 113 deaths in the group served and 163 in the group

TABLE I

	Maternal Deaths per 1,000 Births		Stillbirths per 1,000 Births		Infant Deaths under 1 Month per 1,000 Live Births	
	Under Care	Not under Care	Under Care	Not under Care	Under Care	Not under Care
<i>All Demonstrations</i>	3.2	7.6	25.8	48.4	16.3	39.4
Fargo, N. D.	3.9	5.4	17.0	44.2	9.3	49.4
Marion County, Ore.	0.0	3.8	6.2	37.5	16.7	31.4
Clarke County, Ga. Total	6.5	15.2	30.4	70.1	33.6	46.2
White	4.8	6.3	9.7	44.0	29.3	31.7
Colored	7.9	28.6	47.6	109.6	37.5	69.7
Rutherford County, Tenn. Total	2.5	8.3	43.1	49.3	12.9	39.2
White	1.8	7.3	38.9	46.7	9.2	34.4
Colored	4.0	11.5	52.6	57.4	21.4	54.8

of the total, nurses of the health department gave prenatal instruction and supervision in coöperation with the family physician. In the group under such supervisory care there were only 8 maternal deaths in comparison with 60 in the group not served, 65 stillbirths in comparison with 383 in the group not served, and 40 infant deaths under 1

not served. The comparative mortality rates in this age group (calculated in relation to the number of infants still alive at 1 month of age) were as shown in Table II.

Where care was given the infant mortality rates were especially low for congenital causes, respiratory diseases, diarrhea and enteritis. Among infants

TABLE II

	Under Care	Not under Care
<i>All Demonstrations</i>	18.1	47.6
Fargo, N. D.	16.5	80.7
Marion County, Ore.	4.3	25.9
Clarke County, Ga. Total	19.5	71.8
White	7.6	49.1
Colored	34.4	114.5
Rutherford County, Tenn. Total	31.5	57.8
White	28.9	48.6
Colored	39.4	83.7

under 1 month of age the mortality rate from congenital causes was 11.5 for the group served and 31.0 for the group not served. Among the older infants the rates for the group served were 5.0 for respiratory diseases and 3.8 for diarrhea and enteritis, as compared with 14.3 and 13.4, respectively, for the group not served.

These figures are supporting evidence that a favorable showing can be secured in the form of low mortality rates where preventive maternity and child health services are organized.—*Health Officer's News Letter*, A. P. H. A., Nov. 22, 1929.

**Full-time Health Protection in Kansas**—In addressing the annual meeting of the County Commissioners in Kansas on November 20, Earle G. Brown, M.D., Secretary of the State Board of Health, cited the value of efficient county health work in the control of communicable diseases. In Jefferson County there was a full-time County Health Department from August 1, 1925, to June 30, 1929. The accompanying table offers a comparison of the number of deaths in this district from certain communicable diseases for the 4-year period immediately preceding the organization of the full-time health organization and for the 4-year period during which the full-time health service was in effect.

The difference in the number of deaths in the two 4-year periods repre-

sents an economic saving of approximately \$125,000 for communicable diseases alone. In addition to this there has been a physical inspection of school children with correction of defects; water, milk and food sanitation; infant and maternal hygiene and other recognized health activities tending toward the promotion of positive health habits.

**County-Wide Health Survey**—A sanitary and health survey was made during 1927 and 1928 of Darke County, O., 71 individuals participating in the field work. Every house, urban or rural, in the entire county was visited. The 1920 census gave a population of 42,911. There are 42 physicians in the county and 134 schools with a total enrollment for 1928 of 8,668. One small hospital with 20 beds is located in Greenville. The county has no tuberculosis hospital and no isolation hospital.

The full-time staff of the County Health Unit numbers 8: the Health Commissioner, his Deputy, a sanitary inspector, a supervising nurse, 3 field nurses and 1 clerk. There are also 3 part-time assistants. In 1927 the per capita expenditure was 42 cents and this was increased in 1928 to 46 cents.

During the survey 10,782 houses were located. It was found that of 31,791 persons actually dealt with in the survey, 3.3 per cent had had smallpox, 27.1 per cent had been successfully vaccinated and 69.5 per cent were unprotected. Approximately 80 per cent of the school children were unprotected. The county is therefore wide open to smallpox.

It was found that 6.4 per cent had had typhoid fever and 5.4 per cent scarlet fever. Undulant fever is a real danger as indicated by the large percentage of milch cows shown to be infected with *B. abortus*. A definite diagnosis of undulant fever was made in 10 human cases. The county being largely rural, more than 75 per cent of the people are

	1921-1924	1925-1929
	Part-Time Health Protection	Full-Time Health Protection
Whooping cough	4	1
Scarlet fever	2	0
Diphtheria	9	0
Smallpox	0	0
Measles	1	0
Typhoid fever	2	0
Tuberculosis	21	7
Totals	39	8



served with outdoor closets of the surface or earth vault type. Of school children, 45.6 per cent showed physical defects.—Reference M. E. Barnes, *Pub. Health Rep.*, 44: 2315 (Sept. 27), 1929.

**Tuberculosis Program for Children**—Since 1924 approximately 100,000 children have been examined by the Massachusetts Department of Public Health. An analysis of the available figures shows that when children begin school life 20 per cent are infected with

tuberculosis, at age 10 there are about 28 per cent infected and at 15 approximately 35 per cent. It has been found that children are infected with the tubercle bacilli to the same degree regardless of nutrition or nationality, if they are exposed to an open case of tuberculosis. When there is definite contact with pulmonary tuberculosis, children are almost always infected.—Henry D. Chadwick, *The Ten Year Program for Children, The Commonwealth*, July-Sept., 1929.

## LABORATORY

C. C. YOUNG, D. P. H.

### A RAPID METHOD FOR PIPETTING BROTH IN MEASURED AMOUNTS

G. D. CUMMINGS

*Bureau of Laboratories,  
Department of Health, Lansing, Mich.*

EVERY media division has had an order at some time for tubes containing measured amounts of broth. When such an order is received it means that the broth must be measured out by burette or by hand. Either method is troublesome and time consuming when the order is large. In this laboratory we employ the set-up illustrated in the accompanying photographs. Figure I shows in detail the parts needed, while Figure II is an assembled picture of the actual operation. Figure I, A, is the set-up ordinarily used for tubing broth in unmeasured amounts so that B is the only new addition.

The operation of the pipette requires two people, one to operate the pipette, the other to hold the tube. With both Mohr pinchcocks closed the funnel is

filled with the broth to be tubed. The pipette is an ordinary 10 c.c. or other volume pipette, with a small orifice blown on the top side of the upper end. The operator opens the top pinchcock to allow the broth to fill up the pipette to the zero mark. The top pinchcock is then closed and the bottom one opened to allow the broth to run off in the required amount. The small orifice at the top of the pipette eliminates the possibility of a vacuum and allows the broth to flow freely.

If the operator holds the pipette so that the broth runs in at an angle (Figure II), there is no danger of loss of material through the orifice. With a small amount of practice the operators can run off tubes with great facility.

Such a set-up may be used with any

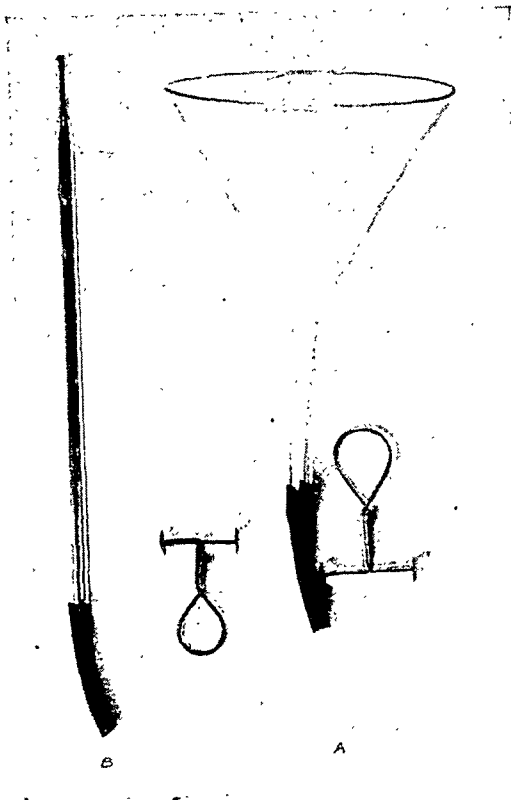


FIGURE I

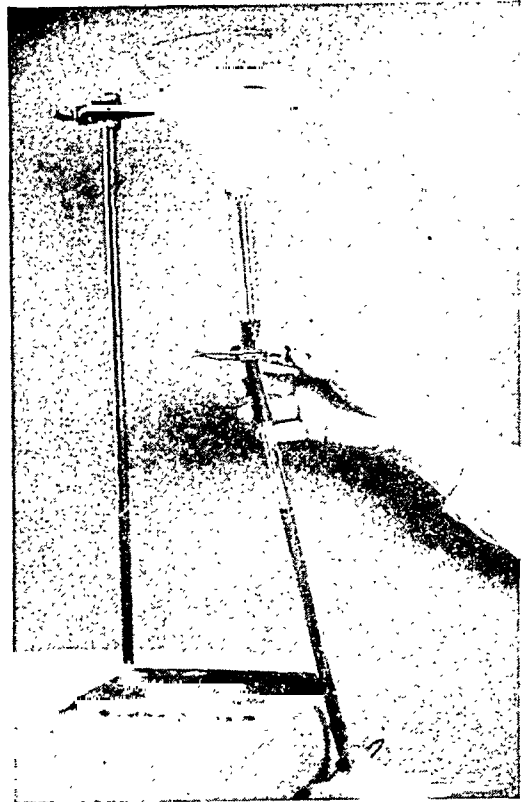


FIGURE II

sized pipette, Mohr or transfer, and with any funnel. We have found by actual timing that we can run off a given batch

of tubes with this arrangement in about one-eighth of the time usually consumed, with equal or greater accuracy.

## THE CAUSE OF MUSTINESS IN EGGS

M. P. SPANSWICK, F. A. P. H. A.

*Bacteriologist, State University of Iowa, Iowa City, Ia.*

WHILE making bacteriological examinations of eggs for a commercial packing concern in Des Moines, Ia., the author isolated an organism which is the causal agent of "must" in eggs. Commercially, musty eggs present a real problem, since one such egg will render all with which it comes in contact unfit for use in the preparation of food products.

The organism is a very small, motile, Gram-negative, aerobic, non-sporulating bacillus, growing profusely on agar in 5

days at room temperature, but not at 37° C. It produces a very characteristic musty odor. It does not liquefy gelatin, reduce nitrates, produce indol, or change litmus milk. Although moderately acidophilic when first isolated, repeated subculturing has gradually increased its alkaline tolerance. It still retains its ability to produce its characteristic odor.

Fresh eggs inoculated with broth cultures developed the typical musty odor in 5 days. No change was noted in the

appearance of the eggs except a slight iridescence in the white in some instances. The organism was recovered in pure culture from all the eggs inoculated.

According to the classification adopted by the Society of American Bacteriologists, the organism is of the *Genus Achromobacter* but differs from the species described. When this work was started

in 1926 no mention had been made in the literature of an organism causing must in eggs. Since then A. W. Turner<sup>1</sup> of Melbourne, Australia, has described apparently the same organism. He proposes to call it *Achromobacter perolens*.

#### REFERENCE

1. Turner, A. W. *Australian J. Exper. Biol. & Sci.*, Vol. IV, 1927.

### MINUTES OF THE MEETING OF THE COMMITTEE ON STANDARD METHODS OF THE LABORATORY SECTION

A MEETING of the committee was held at the Hotel Curtis, Minneapolis, on October 1 at 6:30 P.M. The following were present: E. O. Jordan, *Chairman*, R. G. Perkins, L. M. Wachter, W. H. Frost, A. Wadsworth, W. H. Park, N. MacL. Harris, and J. F. Norton, *Secretary*. Drs. Gilbert and Reddish were present as referees.

Dr. Ruth Gilbert, the referee on the Standardization of the Wassermann Test, presented a progress report dealing with comparative tests between the complement-fixation and precipitation methods. The report was presented in full at a session of the Laboratory Section. It was voted to recommend that an abstract\* of Dr. Gilbert's report be published in the *American Journal of Public Health* and that permission be given her to publish in full, elsewhere.

Dr. Reddish presented a brief report as referee on the Standardization of Methods for testing Disinfectants. He recommended that his modification of Hygienic Laboratory Method be recommended by the Committee to the Association. No action was taken on the recommendation.

The report of C. T. Butterfield, the referee on Bacteriologic Methods for

Water Examination, was discussed by items. The following summary includes all recommendations discussed except editorial changes.

*Recommendation*—That the mouth end of all pipettes be protected with cotton plugs. *Approved.*

*Recommendation*—Increase in the temperature for sterilization of glassware. *Approved as follows:* The temperature should be 170° C., except where it is known by means of recording thermometers that the oven temperatures are uniform, under which exceptional condition 160° C., may be used.

*Recommendation*—Specification of Witte's peptone in place of Fairchild's. *Approved.*

*Recommendation*—Omission of the "drop-ratio method" for the determination of the pH. *Approved.* Buffer solutions should be checked with a potentiometer not less than once a year. If molds are present the buffer should not be used.

*Recommendation*—That the reaction for media be changed to a pH of 6.6 to 7.2 or 7.4. *Change approved to read:* 6.4 to 7.0.

*Recommendation*—In the preparation of nutrient agar to omit "cool to 45° C. . . without stirring." *Approved.*

The present formula for Endo medium was approved but it was suggested that an optional formula be given.

*Recommendation*—That "under no conditions should distilled water be used for dilution." *Approved.*

*Recommendation*—That the specification "Gram negative" be eliminated in the definition of organisms of the coli-aerogenes group. *Not approved.*

\* See page 47 of this issue.

*Recommendation*—That only one typical colony required to be picked for the completed test. *Approved to read*: "one or more."

*Recommendation*—That the paragraph on the interpretation of results in the coli-aerogenes group be omitted or modified. Committee *approved* the *re-writing* of this paragraph.

*Recommendation*—That the section giving methods for differentiation of fecal from non-fecal members of the coli-aerogenes group be omitted. *Not approved*.

A majority of the committee was opposed, at the present time, to the inclusion of Brilliant Green Bile as a standard medium.

Changes in the following chemical methods were presented but action was withheld until the exact procedures could be formulated—manganese, rapid boiler water analysis, chemicals used in water purification, iodides, turbidity, phenols, settleable solids in sewage, total solids in sewage, fixed and volatile sulphides.

No report was received from the referee on Microscopic Methods.

It was agreed that some mention should be made of methods for the examination of swimming pool water.

It was tentatively agreed to change the method for the preparation of standard lactose broth so that after the ad-

dition of the portion of water the medium should be of the approximate composition now regarded as standard.

A complete report concerning the methods for reporting the numbers of coli-aerogenes group organisms will be prepared during the coming year.

It was voted to request permission from the Surgeon General of the U. S. Public Health Service to publish the report of the "Advisory Committee on Official Water Standards" as a supplement to the next edition of *Standard Methods of Water Analysis*.\*

The following referees were appointed:

*Chemical Methods for Water Analysis*

A. M. BUSWELL

*Microscopic Methods for Water Examination*

GORDON M. FAIR

*Bacteriologic Methods for Water Examination*

C. T. BUTTERFIELD

*Bacteriologic Methods for Milk Analysis*

R. S. BREED

*Chemical Methods for Milk Analysis*

F. C. BLANCK

*Standardization of the Wassermann Test*

RUTH GILBERT

*Shellfish Analysis*

F. P. GORHAM

*Air Analysis*

LEONARD GREENBURG

JOHN F. NORTON, *Secretary*

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\* This permission has been granted. J. F. N.

# VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

**Maternal Mortality in the United States**—The maternal mortality rate for the United States is comparatively very high and has declined but slightly during the past decade. The Maternity and Infancy Act was passed in 1921. In that year, deaths of women from puerperal causes were 68 per 10,000 live births and in 1927 had declined to 65 per 10,000 live births. The decline was slightly greater in the rural than in the urban area. Puerperal septicemia accounted for 40 per cent of all puerperal deaths in the United States in 1927, the rate being 25 per 10,000 live births as compared with 16 for England and Wales and 19 for Scotland.

The U. S. Children's Bureau has begun an investigation of maternal deaths in 15 states in response to requests from state departments of health and state medical societies. A preliminary report has been made of the investigation of the 1927 maternal deaths for 7 of the states. There were 1,256 maternal deaths reported and 480 of these were due to puerperal septicemia. Abortions preceded 42 per cent of the deaths from septicemia and 87 of the 200 septic abortions were self induced. There were also 99 deaths in which abortion was a factor, or a total of 299 abortions for the 1,256 maternal deaths in the 7 states.

Reports were also made of the findings in Nebraska and Maryland for 1927. The infant mortality rate for Nebraska in 1927 was 51 per 10,000 live births. The maternal mortality rate was 59 per 10,000 live births in Nebraska in 1927 as compared with 65 for the whole birth registration area. The rate for the urban area was 92 per 10,

000 live births and 49 for the rural area. First pregnancies showed a maternal mortality rate of 71 per 10,000 live births as compared with 51 for later pregnancies. In Nebraska, less than one-half of the maternal deaths followed births of living children, more than one-fourth followed abortions and about one-seventh followed stillbirths. For Maryland, the infant mortality rate was 81 per 10,000 live births in 1927; 68 for white infants and 134 for negro. The maternal mortality rate for the white race in Maryland in 1927 was 54 per 10,000 live births and 72 for the negro. There were 187 maternal deaths reported and the results of the analysis for the white race in Maryland were very similar to those for Nebraska.—D. C. Mendenhall, *Med. J. & Rec.*, 130: 407-408 (Oct. 2), 1929.

**Scarlet Fever**—It is a well known fact that scarlet fever is a disease of temperate countries, being specially prevalent in the countries of the north and very rare in the tropics. There has been a recent increase of the disease in Europe, specially in Eastern Europe. In the U. S. S. R., the number of cases rose from 33,263 in 1921 to 75,718 in 1928. For some years, the prevalence of scarlet fever has been increasing in the United States. In 1925 there were 135,937 cases among a population of 86,571,000 in those states where the disease is notifiable; in 1926 there were 143,150 cases, and in 1927, 158,978 cases in a population of 90,482,000. For selected countries of Europe, America, Asia and Australia, a considerable increase has been observed since 1922, when there were 473,328 cases, the max-

imum having been reached in 1927, with 833,647 cases.

The scarlet fever case rate has shown a general tendency to diminish in Western Europe during the last 30 years. In Germany the decline was particularly marked between 1901 and 1917 and since then seems to have reached a stabilized level. The same applies to Belgium, France, Spain and Switzerland. The minimum case rate in the Scandinavian countries was reached after the great epidemics of the middle of the last century. In Italy, the scarlet fever case rate shows a tendency to stabilization though considerable fluctuations occur. On the other hand, in Eastern Europe the case rate is increasing. The rate for Czechoslovakia has increased from 31 per 100,000 in 1920 to 146 in 1928 and for U. S. S. R. from 129 in 1921 to 255 in 1928.

There is no doubt that the case mortality rate is at present decreasing in most countries of Western Europe. In 1928, the mortality rate in Germany was 0.9 per 100,000 as compared with 3.1 in 1921; the rate in England decreased from 1.2 in 1920 to 0.7 in 1927. A decline from 2.5 in 1920 to 1.1 in 1927 has been observed for the United States. In Eastern Europe, the mortality rate is still very high. In 1928 it was 5.4 in Roumania and 3.5 in Czechoslovakia.

Similar declines were shown for the scarlet fever death rates in the various countries. Thus, in Germany the death rate fell from 3.2 per 100,000 in 1920 to 1.7 in 1928, in England and Wales from 3.8 in 1920 to 1.5 in 1927 and in the United States from 4.6 in 1920 to 2.1 in 1927. Again the highest rates for 1928 were observed in Eastern Europe, Roumania having a rate of 4.8, and Czechoslovakia 5.5 per 100,000.

The fundamental causes for this general decline in the scarlet fever case rate and death rate are the mass immunity brought about by great epidemics dur-

ing the last century and the improvement in the living conditions of the poorer classes.—*Epidemiological Report of the Health Section of the League of Nations*, 8: 245-276 (July 15), 1929.

**Results of Treatment of Diabetic Children**—Prior to the discovery of insulin in 1922, diabetes in children was almost invariably fatal. Joslin treated 169 children who had diabetes from 1914 to 1922 and reported that one-third of them were still living at the end of the period. The experience at the Mayo Clinic was similar. From 1919 to 1922, 32 cases were treated and 21 deaths recorded. The survivors, 9 in number, benefited by insulin but 1 has since died. Thus, 70 per cent of the cases in the pre-insulin period resulted in death.

Insulin has changed the prognosis completely. In the first 6 years after its introduction, 167 children were treated at the Mayo Clinic, and a recent review of their progress showed that 147 were still living in 1928. They were all in good health except 3, 1 of whom had severe rickets and 2 who had unsatisfactory home care. There were 17 deaths in this series, a mortality of 10.4 per cent, which is a decided change from the pre-insulin mortality. In the last 3 years, about 4 per cent of the children have died.

Last year the annual mortality was 1.3 per cent, which is not much higher than the annual death rate for non-diabetic children. Of the 17 deaths, only 1 occurred at the clinic and this case was brought in moribund after 28 hours in coma. None of the other cases were under the immediate observation of the clinic; 8 had not been seen for from 6 months to 3 years. In 2 cases, death had occurred from influenza and encephalitis, diseases not related to diabetes. A third case died from meningitis but diabetic treatment had been neglected so that coma may have occurred termi-

nally. In all of the other cases, except 3 about which the information was incomplete, coma was the known cause of death and occurred from preventable causes such as failure to receive insulin, improper use of insulin along with carelessness in dieting and unsatisfactory medical supervision.—F. N. Allen, *Proc. Staff Mect. Mayo Clin.*, 4: 270-271 (Sept. 11), 1929.

**Puerperal Septicemia in Massachusetts, 1928**—This is a report of the committee appointed to study the incidence of puerperal septicemia in Massachusetts in 1928. The number of puerperal deaths reported for 1928 in Massachusetts was 456, and 123, or approximately 27 per cent, of these were due to puerperal septicemia. This is the lowest number of total puerperal deaths since 1912 and the lowest number of deaths from puerperal septicemia since 1916. Of the 123 deaths, 19 were due to puerperal septicemia in cases of abortion. The largest number of puerperal deaths were in March and the lowest number in September, and this seasonal distribution has been fairly constant over a period of a great many years.

From requests sent to physicians, 63 replies were obtained and 50 of these furnished sufficient data to use as a basis for this study. Primipara contributed 30 per cent of the deaths; para II, 32 per cent; and other multipara contributed from 2 to 12 per cent of the deaths. Of the 50 cases, 42 per cent died at home, 48 per cent in hospitals and 10 per cent did not report. There were normal deliveries in 54 per cent of the cases, instrumental in 6 per cent, 4 per cent were delivered by version, 2 per cent were undelivered, and 34 per cent did not report. Complications were present in 44 per cent of the deliveries and 28 per cent had no complications.

Adequate prenatal care was reported

in 64 per cent of the cases, doubtful care in 14 per cent, no care was received in 16 per cent, and 6 per cent of the cases did not report. Of the total number of cases reported, 6 per cent were autopsied and the autopsy confirmed the diagnosis of puerperal septicemia.

The highest birth rate, 26.4, in the state during 1928 was reported from Woburn, which did not report any cases of puerperal septicemia, but did report 2 deaths in the puerperal state. Waltham and Fitchburg, with birth rates of 24.2 and 20.4 respectively, each reported 2 puerperal deaths but neither from septicemia. Newburyport and Melrose, whose birth rates were 21.6 and 20.4 respectively, reported no puerperal deaths. Brookline, whose birth rate, 3.1, was the lowest, did not report any puerperal deaths. The city of Boston did not report any deaths from puerperal septicemia in November, 1928, and 1 each in September and December, 1928.—*New England J. Med.*, 201: 470-473 (Sept. 5), 1929.

**Public Health in Kenya**—A report of conditions in the Colony and Protectorate of Kenya states that according to a census taken in 1926, there were 12,529 Europeans, 30,583 Asiatics and 10,577 Arabs in the colony. The estimated African population in 1927 was 2,847,632. Local native health councils have taken an increasing interest in health matters. On the coast, useful measures are being taken against hookworm infestation. The country has been free from epidemics of serious diseases. Plague required watching but no serious outbreaks occurred during 1927.

Smallpox was introduced from India and caused some uneasiness because the cases were observed over a considerable area. The outbreak did not assume any magnitude, no doubt due to the wholesale vaccination campaign conducted two years ago. The epidemic of mala-

ria experienced in 1926 did not recur. Over 200,000 individuals were examined for trypanosomiasis, and only 380 cases were detected, these being found in well defined areas. In one small locality of about 800 population, over 100 cases were found. Progress for provisions of loan funds for hospitals has not been so rapid as was hoped, but one small hospital is practically completed.—*Lancet*, 217: 312 (Aug. 10), 1929.

**Official Vital Statistics of Scotland**—The Health Organization of the League of Nations has published a handbook which describes the procedure of gathering vital statistics in Scotland. For the purpose of local health administration, Scotland is divided into burghs, county districts and counties. In the Lowlands and along the seaboard, local health services are well equipped with modern facilities and are excellently administered. The Census Act of 1920 became a permanent measure. It empowers the authorities to ask for a census at 5-year intervals. Prior to this, a special act was passed for each decennial enumeration. The Registrar General directs the census and the enumerators are selected by local registrars.

Births of living children must be declared to the registrar within 21 days by either of the parents, the medical attendant or some other appropriate person. The registrar has the authority to require this declaration personally or in writing within 3 months after birth. All births must be allocated to the parish of habitual residence of the parents of the child. Stillbirths must be notified as such by the attending doctor to the public health authority but not to the registrar. The mother of an illegitimate child is primarily responsible for the declaration of the birth. Such a

child is legitimated by the subsequent marriage of the parents.

Deaths must be declared to the registrar by a relative of the deceased or other appropriate persons within 8 days. A medical certificate of the cause of death must be completed by the medical practitioner attending the person during his last illness. There is no specific procedure for transmitting these certificates to the registrar. The *International List of Causes of Death* as revised in 1920 has been in use since 1911. The Registrar General publishes an annual report that contains information relating to the mortality of the country.

There are 11 infectious diseases that are compulsorily notifiable, 6 more notifiable in certain areas only and 12 others optional. Notification must be made by the head of the family, medical attendant or other appropriate persons to the medical health officer of the area. Local authorities are required to provide proper and sufficient means for disinfection. Vaccination is compulsory and effective within 6 months of birth.

County, municipal and hospital bacteriological laboratories are established throughout Scotland. Special decennial supplements are published by the Registrar General and include all relevant statistical data such as occupational and infant mortality which appeared in the annual reports during the decennium. There are also published independent annual municipal reports prepared by the medical officers of health of the principal Scottish cities and burghs. Notable features of these reports are the results of special studies or investigations relating to diphtheria, puerperal mortality, cancer, infant mortality and similar special studies.—League of Nations: Health Organization, *Statistical Handbooks Series No. 13*, Geneva, 1929.



# PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

## ILLINOIS MOBILE WATER AND SEWAGE LABORATORY

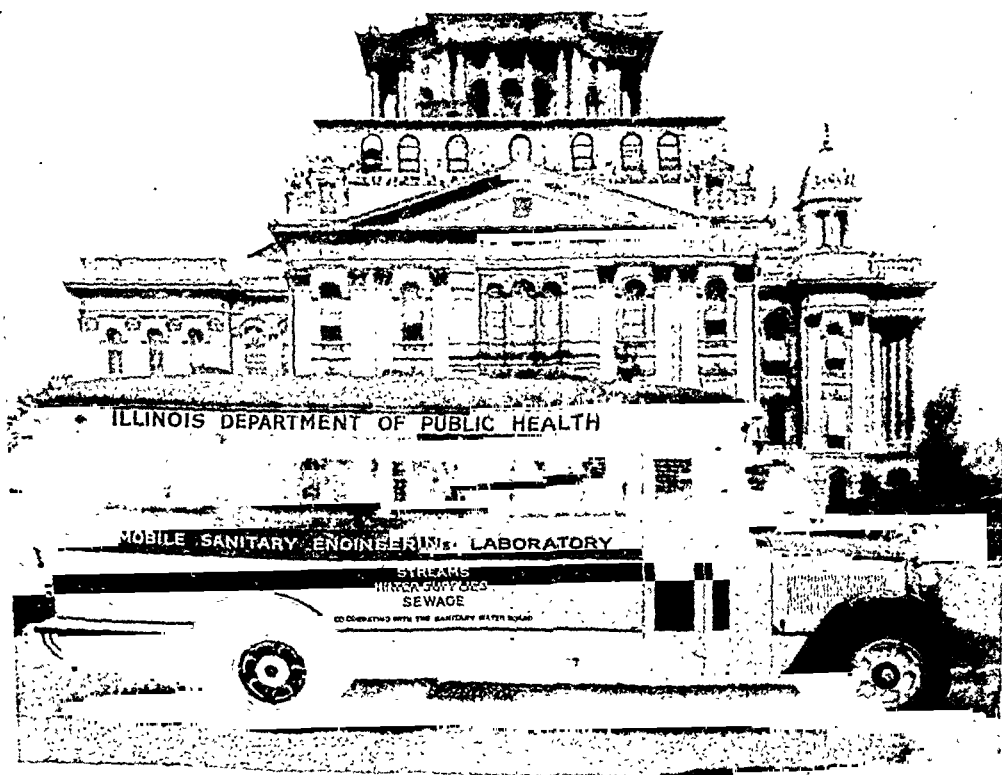
ANSELMO F. DAPPERT AND HARRY F. FERGUSON, F. A. P. H. A.

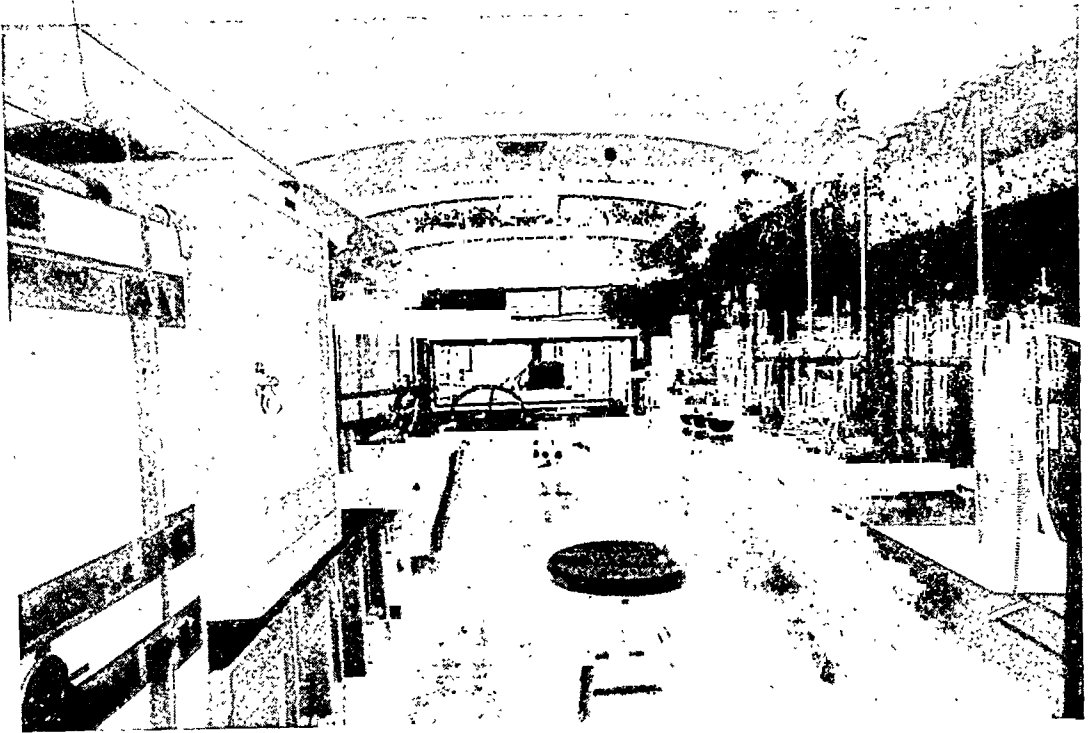
*Assistant Engineer and Chief Engineer,  
Illinois Department of Public Health,  
Springfield, Ill.*

A COMPLETELY equipped mobile water and sewage laboratory was placed in service during the summer of 1929 by the Sanitary Engineering Division of the Illinois Department of Public Health. This laboratory will be used in carrying out the work and duties of the Department of Public Health in connection with water supplies, sewage works and stream sanitation, and will cooperate with the Sanitary Water

Board established by an act of the 1929 legislature, of which board the Director of Public Health is chairman and the Chief Sanitary Engineer is technical secretary. The mobile unit will lead to more efficiency and economy in field analytical work and will make possible more complete analytical data than has been possible with previous field equipment.

The experience acquired by the Sani-





INTERIOR LOOKING TOWARD THE FRONT

tary Engineering Division in designing and operating a mobile milk laboratory, which was constructed and placed in service during 1927, proved very helpful in planning and equipping the mobile water and sewage laboratory. The mobile milk laboratory has proved so sturdy and satisfactory that the water and sewage laboratory was made substantially similar, with some additional refinements and the necessary changes in benches and equipment to make it suitable for the different kind of work.

By use of the mobile water and sewage laboratory the development and maintenance of public water works can be improved, especially the operation of water purification plants, so that waters will be more assuredly safe and, incidentally, more economical operation of some water purification plants will be possible. It will be especially valuable for studying and checking the operation, efficiency and effectiveness of sewage treatment works and for stream pollution surveys, in furthering the interests of stream sanitation and conservation.

Some analyses of sewage and polluted streams must be made in the field if they are to be fully representative and valuable.

It has been very difficult and sometimes impossible in the past to handle such field analytical work without a mobile laboratory. Taking into consideration quality and quantity of work the mobile unit will make more economical such analytical work than has been possible with ordinary automobiles and boxed laboratory equipment, and there will be a saving on shipment of sample containers to and from the main Sanitary Engineering Laboratories at Springfield. It is estimated that the saving in traveling and transportation expense ordinarily incurred in the investigation of water and sewage works and polluted streams, as conducted in the past, will nearly compensate for the investment and operation cost of the mobile laboratory, and at the same time make possible more effective and reliable work. The cost, fully equipped, was only about \$5,900.

Among the analyses and tests that can be made in the mobile laboratory will be odor, color, turbidity, ammonia nitrogen, nitrites, nitrates, alkalinity, acidity, pH, chloride, chlorine, iron, dissolved oxygen, oxygen consumed, biochemical oxygen demand, bacterial counts, *B. coli*, and microscopical examinations.

The mobile laboratory staff will generally comprise two sanitary engineers who have had experience in addition to technical school training on analyses of water and sewage. The water and sewage bacteriologists and chemists of the Sanitary Engineering Laboratories at Springfield will be available to advise with the sanitary engineers, and even to go into the field with the mobile laboratory when special investigations or studies require special bacteriological and chemical services.

The work that was scheduled for this mobile unit as soon as it was placed in the field, most of which was based upon requests from those that had heard that the unit was being provided, indicates that this unit will be in constant service. This might well be expected when it is realized that there are over 500 public water supplies and about 200 sewage treatment works in the state, and that many streams are now so polluted that they are threatening existing and future water supplies, destroying fish and other aquatic life, destroying cattle watering places, making unsafe and unusable important bathing and recreational water areas, and causing some nuisance from odors and appearance.

Although the extensive Illinois hard road system makes it possible for most of the mobile laboratory travel to be on excellent, even roads it was decided in planning the mobile milk laboratory in 1927 that the body should be of sturdy construction. This was again considered to be a wise plan and therefore a similar standard 21-passenger, street-car type, Dodge Brothers motor bus was

selected as giving sturdy construction at reasonable cost. It is expected that both the milk and the water and sewage mobile laboratories will last and render service many years. The operating and maintenance cost data which have been kept in detail for the mobile milk laboratory confirm this opinion. The only important changes made at the Dodge Brothers factory from the standard bus was the omission of the seats, the installation of shades and fine mesh bronze screens on all windows, and a second wiring system.

In place of the passenger seats, laboratory benches were installed by the Kewaunee Manufacturing Company. One bench is 12 and the other is 9 feet long, providing ample and convenient drawer and cabinet space of suitable size, arrangement, and construction to hold securely the necessary equipment and supplies. Racks for reagent bottles were built in the place usually occupied by advertising racks in automobile passenger buses. All woodwork is of quarter-sawn oak with a pleasing, durable silver-gray stain and wax finish, except bench tops, which are of narrow birch strips matched, glued and treated with a black acid-resistant stain. The bench tops have special spring construction to prevent warping. Special consideration was given by the manufacturers to the strain of travel in the design and construction of the laboratory furniture.

There are dual wiring circuits. One circuit supplies 6-volt current from either the regular motor-generator-battery electric system or a special rectifier and battery system to the regular ceiling lights, an electric fan, and heating elements in the incubators. The other circuit was designed for 110-volt current and serves additional ceiling lights, 12 service outlets and a bacterial plate counter in the bench top, 6 service outlets on the uprights between windows, electric fans, movable electric room heaters, and a heating element in the



INTERIOR LOOKING TOWARD THE REAR

37.5° incubator. The 110-volt circuit can be used when that current is available at the water or sewage plants or where the laboratory is stationed, and can easily and quickly be connected by means of a 100-foot reel of insulated wire and feed plug carried in one of the cupboards having a covered hand hole from it through the bus body to the outside.

A 20° incubator is placed at the end of one bench and a 37.5° incubator, a gasoline stove and a drying oven are mounted on one bench top. An autoclave, water still, gravity dilution water bottle and rack, necessary gasoline and alcohol torches, and all miscellaneous equipment and glassware affording the most modern laboratory facilities, are provided. All equipment and supplies are installed or stored so as to be easily available with minimum time and effort of handling between laboratory set-ups. Seven burette rods are screwed into fittings in one of the bench tops. The burette rods and also the electric service outlet plates and sink faucet are chromium plated.

Running water is available at a white enameled sink built in one of the bench tops. The water is stored in a 30-gallon tank suspended from the car frame below the laboratory floor. Water and air pipe connections extending through the bus body make easy the filling of the tank with water and applying air pressure through the tire valve on the air-line. This makes it possible to obtain water and air pressure at any gasoline-filling station. A metal tank, mounted under the laboratory floor, equipped with suitable piping and valve, serves to store the waste sink water when and where it is not desirable to discharge such waste water directly onto the ground.

A door at the right front and another at the rear of the center aisle with folding step afford ready access and also facilitate passage of persons through the bus when it is used for educational or exhibit purposes.

The aisle is wide and long enough to accommodate folding cots, providing bed space for two persons. The cots can be stored in one of the bench

compartments. These sleeping accommodations will be valuable especially when running 24-hour tests on sewage works or if the mobile unit at any time is called into special service following disasters such as tornadoes and floods.

The interior can be heated by two floor heaters located in the aisle and operating on the engine exhaust, in addition to the movable electric heaters that can be operated off the 110-volt current when available.

In addition to making it possible to comply with the increasing requests to the Department of Public Health and the newly organized Sanitary Water

Board, for water, sewage and stream analytical services, it is considered that the bringing of this mobile laboratory to water and sewage works throughout the state will serve to stimulate and bring about more and better local analytical control of such works, similar to the results obtained through the mobile milk laboratory visits to milk pasteurization plants. The Illinois Department of Public Health believes that this mobile water and sewage laboratory is equal in design and equipment to any operating in the United States and will be a factor in maintaining public health work in Illinois on a high scientific standard.

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**Changes in Composition of Gas during Digestion of Fresh Solids—**The changes in the composition of the gas produced during the course of digestion of fresh solids were considerable. The CO<sub>2</sub> varied from 37.7 per cent during the first week to 25.3 per cent at the end. The methane content varied likewise from 47.8 to 69.8 per cent. For practical purposes 80–85 per cent of the total gas produced is the practical limit. If 10 per cent more gas is required, the digestion time must be increased by 25 per cent and to get all the gas the digestion time should be doubled. When 80–85 per cent of the gas has evolved the sludge is stable and has only a "gas odor" and drains well.—W. Rudolfs, *N. J. Agri. Exper. Sta. Bull.*, 486: 54–59, 1929. Abstr. W. Rudolfs.

was made whereby the City of Lawrence disposes of the sewage on payment of \$50 for each residence connected to the sewer system, and also on payments to reimburse the City of Lawrence for building and rebuilding certain main sewers within the city. Furthermore, all real estate within the sewer district is taxed to support the system at the same tax rate that prevails in the City of Lawrence for sewerage purposes. The district agrees to abide by whatever ordinances prevail in the city relating to exclusion of troublesome substances to the sewer and to plumbing restrictions.

Other notable examples of sanitation districts are mentioned, including the Los Angeles County Sanitation Districts and the Chicago Sanitary Districts.

The article states that the law that provides for the creation of the district contains "the basic elements of a most needed and useful instrument. The refining effects of protests, court actions, experience of use, and legislative amendments, are needed now to make it applicable to all cases that may arise."—E. F. Kindsvater, *Munic. News & Water Works*, 76, 7: 297–298 (July), 1929. Abstr. C. G. Gillespie.

**Providing Sewer Facilities in Rural Communities—**Chapter 165 of the Session Laws of Kansas, 1927, provides for installation of sewers and sewage disposal in rural and suburban communities. The application of the act to the Douglas County Sewer District No. 1, adjacent to the city of Lawrence, Kans., is described. In this case a contract

# INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

## Report on 1,000 Physical Examinations of Male Clerical Workers.

**Conclusions**—Complete physical examination of 1,000 white male office workers of ages 25 and under to 65 and over revealed that 781 possessed significant physical defects. Minor physical defects only were noted for 213 men. Those essentially free from physical defects numbered 6. In rank of numbers of examinees involved, defects of dentition, weight, vision, cardiovascular system and hearing in the order named were outstanding.

In view of the apparent causes predisposing to heart disease around 40 years, these findings are significant: Among 1,000 male office workers, 1.6 per cent had albuminuria and 1.9 per cent had glycosuria; hypertension was found for 12.9 per cent; and hypotension for 13 per cent; overweight was common to 42.3 per cent. Among all examinees the rate for cardiovascular defects was 36.1 per 100, but among those 20 lb. or more overweight the rate was 49.1 while among those 20 lb. or more underweight the rate was 32.8 per 100. It is also noteworthy that one-third of all cardiovascular defects were found in men under 45 years. Not to be overlooked were 5 per cent with heart murmurs and 12 per cent with definite heart enlargement.

In a large number of instances defects were discovered in this study which were leading to or eventually would lead to serious physical handicap. Such conditions were unknown to 724 men who possessed them, or at least they did not admit knowing of them. Finally, the

examination records of the whole group definitely indicated that 80.5 per cent would profit by early medical care.—William H. Muhlberg, Carey P. McCord, Floyd P. Allen, Special Paper (in mimeograph form), read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 3, 1929.

**History of Workmen's Compensation Laws Covering Occupational Diseases**—Some light on the obstacles which have been met with in the attempt to draft, pass, and perfect workmen's compensation laws is obtained from a study of their development in various countries. The fact has to be borne in mind that the original purpose of compensation laws was to provide, promptly, adequate economic relief and medical care to workmen disabled because of, and in the course of their employment by injuries due to the nature of their work. The laws, therefore, proposed a scheme whereby expensive and discouraging delays might be eliminated and the adjustment reached without recourse to legal hair-splitting. The two earliest laws covering employers' liability for industrial accidents were passed by Switzerland in 1877 and Germany in 1883, and these provided for the inclusion of industrial diseases. Disability to work is the only manifestation of occupational injury which is compensable under the law and disability from disease often does not ensue for several months, sometimes for years. The greatest confusion has resulted from the attempt to hold the employer liable for ill health among his workmen which has

Copies available from Dr. Carey P. McCord, 34 West 7th Street, Cincinnati, O.

been "aggravated" by the nature of the work. The settlement of straight out-and-out occupational disease claims has become a minor portion of the question.

Most of the forms of workmen's compensation acts may be classified thus:

1. Laws which definitely include occupational diseases, either by a schedule naming the diseases, a schedule relating diseases to definite processes, or having no schedule of diseases or processes

2. Laws whose wording is such that diseases are compensable in the same manner as industrial accidents

3. Laws which definitely exclude diseases except those which result from an accidental injury

The paper then discusses the laws of the following countries as they relate to compensation matters, particularly in reference to industrial diseases: Switzerland, Germany, Austria-Hungary, France, Greece, Belgium, League of Nations, Union of Socialist Soviet Republics, Finland, Italy, Spain, Portugal, Serb, Croat, Slovene Kingdom, Great Britain, British Dominions.

Concerning the United States the material is in the form of a table which shows that 4 states (Arkansas, Florida, Mississippi, and South Carolina) have no compensation laws, also one Canadian Province, Prince Edward Island; that 31 states, 2 Canadian provinces and 2 territories exclude occupational diseases from their compensation laws; that 3 states and the United States (civil employees), and 1 territory have laws which might be interpreted to include them; and that 9 states and the United States (longshoremen and harbor workers), and 2 territories, also 7 Canadian provinces, definitely extend compensation to occupational diseases.

The report concludes with a synopsis of the provisions for workmen's compensation laws in the various states in the United States; provisions for reporting occupational diseases, and suggestions for the future work of the committee.—Report of the Committee on

Standard Practices in the Problem of Compensation of Occupational Diseases, presented to the Industrial Hygiene Section of the American Public Health Association at the Minneapolis meeting, October 4, 1929, 40 pp., 1 table.—Dr. A. J. Lanza, *Chairman*, c/o Metropolitan Life Insurance Company, New York, N. Y.

Tentative List of State Regulations, Orders, Advisory Pamphlets and Labor Laws Relating to Safety in Industry (arranged by states of the United States)—Library, National Bureau of Casualty and Surety Underwriters, 1 Park Avenue, New York, N. Y.—18 pp. mimeographed Nov., 1929.

The Health of Workers in Dusty Trades. II. Exposure to Silicious Dust (Granite Industry)—A few years ago, the U. S. Public Health Service began a series of intensive studies on the health of workers in dusty trades. The first study was reported in 1928, and dealt with the health of workers in a cement plant. The report on the second study, dealing with the health of workers exposed to silica dust in the granite cutting industry, has recently been published. The study was of such a character as to present a rather definite picture of what happens to men working for many years under a dust hazard of the extent described. The salient points may be summarized as follows:

- a. The long period of service before the liability to tuberculosis becomes manifest (generally 20 years or more)

- b. The sharp correlation between length of exposure to the dust and the prevalence of tuberculosis and also the death rate from this disease

- c. The close relation between the extent of dust exposure and health of the men

- d. The universal occurrence of silicosis among the workers

- e. The large proportion of workers finally succumbing to tuberculosis

- f. The almost invariably fatal form of the

disease within a short time after the onset

g. The different character of silicosis as manifested by X-rays compared with that shown where there is exposure to a dust with a much higher content of free silica

h. The location of the tuberculosis lesion, usually basal, where the disease complicates silicosis

i. The absence of deaths from silicosis *per se*, tuberculosis apparently always intervening

j. The failure of workers to recover from their condition upon going into non-dusty trades

k. The high incidence of sickness of a severe nature from causes other than tuberculosis

l. The rising sickness and mortality rates from tuberculosis due to longer use of the hand-pneumatic tool

m. The high death rates at the present time from tuberculosis, compared with normal industrial experience

X-rays, micro-photographs of the lungs, detailed histories of cases, discussions and statistical findings accompany.—*Pub. Health Bull.* 137, 1929, 209 pp.

**Industrial Dental Service**—A study of physical defects in a group of 16,000 individuals, published in 1925 by Dublin, Fisk, and Kopf, showed that over 8 per cent had decayed teeth or infected roots; over 15 per cent infected gums or pyorrhea; and almost 42 per cent heavy dentistry which warranted X-ray examination. Above all does the average individual need frequent counsel and guidance regarding his teeth.

In an organization of 1,000 employees, a single chair, a part-time dentist, and a full-time hygienist may be sufficient to do prophylactic work, extractions, and minor filling operations—clerical assistance should not be overlooked. The cost of chair, including cuspidor and engine, and of instruments is about \$1,500. X-ray equipment would approximate an additional \$800. Proper record forms should be used (and samples of these are exhibited).

In the experiment of the Metropolitan Life Insurance Company in which 1,000

good mouth conditions were compared with 1,000 poor mouth conditions, the following diseases or conditions were all more pronounced (in some cases triply so) in the case of the latter: neuralgia and neuritis, headache, nervousness, colds, furuncles, abscesses, and albuminuria. A brief discussion is given of the dental service conducted by the Metropolitan Life Insurance Company; the United Railways & Electric Co., Baltimore, Md.; the Sullivan Machinery Company, Claremont, N. H.; the National Lamp Works, General Electric Company, Cleveland, O.; Jordan Marsh Company, Boston, Mass.; Corning Glass Works, Corning, N. Y.; the Union Health Center Dental Clinic, New York, N. Y.; and the Hood Rubber Company, Watertown, Mass. The most extensive of these appears to be that of the Union Health Center Dental Clinic, which is conducted by the New York locals of the International Ladies' Garment Workers' Union, whose work in 1927 included 9,338 X-rays, 11,548 prophylaxes, 2,575 general treatments, and 16,709 other treatments—making an average of 625 patients per day, the charges ranging from \$4.00 to \$5.00 an hour and cost of materials. (The article gives a list of the 12 institutions where dental hygienists are trained and a list of some 90 companies which have industrial dental dispensaries in the United States and Canada.)—Metropolitan Life Insurance Company, Special Pamphlet, *Industrial Dental Service*, Ill., *Industrial Health Series No. 3*, 1929, 31 pp.

**Industrial Disease Investigation Bureau**—The bureau began operating January 1, 1929, and reports for the period to June 30, 1929. It employs a field director, a medical director, a technician and laboratory expert, a consulting chemist, and a consulting pathologist.

The New Jersey State Law provides



for compensation for: anthrax; poisoning by lead, mercury, arsenic, phosphorus, wood alcohol, and chrome, benzene and its homologues, and all derivatives thereof; caisson disease; and mesothorium or radium necrosis.

Under "Investigation," 29 plants were covered, 10 using benzene or its derivatives (dyes, perfumes, chemicals, and artificial leather—despite the fact that the Department of Labor has recommended that benzene be eliminated in industry due to its poisonous qualities, in which most plants have concurred); 11 using lead and its products (smelters, making of reflectors, storage batteries, chemicals, pottery, colors, and tetra-ethyl lead); 7 using mercury (hat factories, chemicals, thermometers, and storage batteries), and 1 using chrome. It was quite evident that chronic mercurial poisoning still exists in hat factories since tremors (shakes) were common in a large proportion of the men seen in the shops.

Physical examinations in plants covered 89 workers exposed to benzol (10 showing strongly suggestive symptoms), and 21 exposed to lead (8 found to be suffering from active lead absorption despite the fact that they were wearing respirators).

Concerted effort has been made to spread knowledge of occupational diseases among physicians, employers and employees, both concerning occupational diseases and the special clinic set up for their investigation in Newark. This clinic provides free laboratory work and other diagnostic facilities, and makes diagnoses which are available to the family physician, but no treatment is attempted. A museum is contemplated. An accompanying table shows that for the first 6 months of 1929, 184 patients were examined at the clinic, 321 tests made, 230 blood counts, 11 urinalyses, 5 tests for lead in urine, 1 test for lead in the feces, 2 for blood Wassermanns, 13 tests for mercury in urine, and 59 tests

for coagulation and bleeding time. These concerned 106 patients exposed to benzene, 27 to lead, 14 to mercury, 1 with phosphorus and 6 undiagnosed. In addition services were offered non-occupational cases at the Newark City Hospital, involving 36 patients suffering from various blood diseases, like pernicious anemias, malaria, leukemia, etc., with corresponding tests, blood counts, etc.

In summary: 24 plants were visited for inspection of processes, etc.; 122 workmen were examined in 4 plants for lead and benzol; while Dr. Henry H. Kessler, the Medical Director, made 203 physical examinations.

On page 33 of the *Bulletin* is a table of 99 poisonous and 274 corrosive substances and 150 occupational diseases, by causes, which were compensated in 1928. Under "occupational" are included certain poisons, compressed air, dust, infections, heat and light, and activity (cellulitis, etc.).—Joint Report of the Industrial Disease Investigation Bureau, New Jersey Department of Labor, *Indust. Bull.*, 3, 9: 11–15 (Sept.), 1929.

Some Physiologic Reactions to Cooling Power during Work—With Special Reference to Evaporation of Water—Among other points the authors point out that removal of clothes during work reduced evaporation from the skin and so did wind. In moist and moving air at 10°, 15°, and 20° C., the amount from the skin was often nearly nil. It is suggested therefore that greater use should be made of the removal of clothing and movement of air to render conditions comfortable for indoor muscular workers.—J. Argyll Campbell and T. C. Angus, *J. Indust. Hyg.*, 11: 315–327 (Nov.), 1929.

Effect of Carrying Loads—Curvature of the spine, as well as inguinal hernia and flat feet, has been observed among persons employed in carrying

loads. Steinmann of Berne and Waeger of Moscow state that under certain circumstances a shock or a false step is sufficient to overcome the resistance of the spinal column of a worker carrying a load, which may injure the whole column or the most exposed vertebra. This occupation shows high statistics of accidents, a considerable proportion of which affect the spine. The risk of disease varies directly with the size of the load; consequently, legal regulation of the weight of loads would mark an important advance in the prevention of accidents and occupational diseases of the type described. The International Labour Organization is called upon to draft an international Convention fixing the maximum weight of loads to be carried at 75 kilograms (165 lbs.).—*Industrial and Labour Information*, International Labour Office, Geneva, XXIX, II: 334–335 (Mar. 18), 1929.

### The Problem of Displaced Workers—

1. Workers dispossessed by the introduction of labor saving machinery and the rationalization of industries do not easily find new employment, as 45 per cent of 754 workers in Baltimore, Md., Chicago, Ill., and Worcester, Mass., had not found employment when seen by investigators.

2. Of those who found new employment, more than one-half had been idle for more than 3 months.

3. Less than 10 per cent of those surveyed were reemployed at their old jobs; two-thirds went into entirely different industries.

4. Only about 15 per cent went into the rapidly growing "newer" industries and service trades.

5. About one-half of those finding new jobs succeeded in getting tasks which were similar to those formerly held.

6. A large majority of dispossessed workers supported themselves and families during the early period of unemployment by accumulated savings. Approximately one-third found temporary work.

7. Transition from one job to another was in most cases made with a sacrifice of income, as almost one-half took new jobs at

lower wages, while 18 per cent benefitted by the change, and one-third experienced no change of income.

8. The age of the worker appears to be a significant factor in securing new work, as relatively fewer of those over 45 years of age were able to secure new jobs as compared with the younger workers, and they were out of work for longer periods at a time.

In order to deal with this form of unemployment a greater perfection in employment exchange system is needed and some form of unemployment insurance is urgently required, but the government's participation in the latter is considered neither necessary, nor advisable at the present time.—Institute of Economics, Brookings Institute, Washington, D. C., *Industrial and Labour Information*, XXXI, II: 344–346 (Sept. 9), 1929.

Status of Industrial Safety Regulations—In an effort to obtain a statement as to the specific safety codes or regulations in force on January 1, 1928, in the various states, the U. S. Bureau of Labor Statistics communicated with each state and received replies from all except two. It is impossible to present a summary of the information obtained by the U. S. Bureau of Labor Statistics. Suffice it to say that an excellent digest is presented showing the status of safety codes in the various states. Those interested in obtaining information as to the status of safety codes throughout the United States are referred to this paper for an excellent summary of the subject.—U. S. Dept. Labor, *Month. Labor Rev.*, 28, 3: 521 (Mar.), 1929. L. G.

How Chemistry has changed Industry, and as a result has changed the Tendency to Occupational Disease—G. D. Gehrmann, Medical Director E. I. du Pont de Nemours & Co. U. S. Bureau of Labor Statistics, *Bull. No. 485*, 125–129 (June), 1929.

# FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

**Nutritive Value of Proteins in Certain Kinds of Sausage and Other Meat Food Products**—The importance of sausage is emphasized by the fact that sausage and sausage casings in the amount of more than  $1\frac{1}{2}$  billion lb. were manufactured in the United States in 1925 exclusive of that made by small dealers and farmers.

Sausage as defined by the U. S. Department of Agriculture is made from meat and meat by-products obtained from cattle, sheep, swine and goats, the meat obtained chiefly from trimmings of swine and cattle carcasses; condiments are used, and a small amount (not more than 3.5 per cent) of cereal may be added.

Previous investigations by the authors have shown considerable difference in protein values in the meat and meat by-products and this work was undertaken to compare the nutritive value of the different types of sausage and meat food products. Six different types of sausage were studied in addition to headcheese, scrapple and meat loaf, and for purposes of comparison fresh pork ham and beef chuck, all obtained from federal meat inspected establishments. Descriptions of the different types of sausage and the meat food products are given.

Young male albino rats were fed the various rations for 60 days; the animals being weighed twice weekly and records kept of the food consumed. Protein was fed at a 10 per cent level and the meats were supplemented by essential dietary factors including mineral salts. Complete tables are given showing the feeding experiments for both the 30- and 60-day periods.

For comparison, meat food products were divided into three groups—first, those of the highest nutritive value, pork sausage, Braunschweiger-style sausage, and meat loaf; second, intermediate values, Frankfurter-style sausage and Bologna-style sausage, and scrapple from one manufacturer; third, the low nutritive values, liver sausage, headcheese, and fresh link sausage, and a sample of scrapple. In the first group, the gain in weight per gm. of protein consumed is from 3.08 (pork sausage) to 3.47 (meat loaf), compared to 2.93 gm. to 3.68 gm. beef chuck and fresh ham. In the second group, gains per gm. are from 2.34 (Frankfurter-style sausage) to 2.87 (scrapple), and in the third group corresponding gains were 1.58 (headcheese) to 2.25 (liver sausage).

At the end of the 60-day period the groups were rearranged, first, including pork sausage, Braunschweiger-style sausage, meat loaf, Frankfurter-style sausage and one sample each of Bologna-style sausage and scrapple; second, one sample each Frankfurter-style sausage and Bologna-style sausage, and the third included headcheese, fresh link sausage, liver sausage and one sample of scrapple.

Weight gains per gm. protein were: Group 1, 2.41 (Braunschweiger-style sausage) to 2.73 (pork sausage) compared to 2.32 (beef chuck) to 2.75 (pork hams); group 2, the range is 1.96 to 2.30 (Bologna-style sausage), and group 3, 1.51 (headcheese) to 1.95 (fresh link sausage). The material differences in nutritive values warranting the classification into groups apply to the samples tested and not generally.

Two lots of scrapple showed a difference in gains of 1.77 and 2.52 respectively, due probably to the greater proportion of lean meat in the second sample which compares favorably with beef chuck and is attributed to the supplemental relationship between meat proteins and those of corn meal.—Ralph Hoagland and George G. Snider, *J. Agri. Res.*, 39: 531 (Oct.), 1929.

**The Pellagra-Preventive Action of Canned Salmon**—Previous observations have been recorded on the black-tongue-preventive action of canned salmon in the dog (Abstr., *A. J. P. H.*, 18: 1183 (Sept.), 1928). Evidence that canine blacktongue is analogous to human pellagra led to the comparative study of canned salmon on pellagra patients in the Georgia State Sanitarium, Milledgeville, Ga. A total of 18 white female patients were under observation and were treated with this diet for a period of 1 year or more. Alaska chum salmon was used and the entire contents of the can were incorporated in the cooked vegetable portion of the diet.

Six ounces of salmon per patient per day were fed. No patient in the group at any time during the test showed symptoms of pellagra, which warrants the conclusion that canned salmon contains the pellagra preventive factor. This is further evidence of the analogy between human pellagra and black-tongue in dogs.—Joseph Goldberger and G. A. Wheeler, *Pub. Health Rep.*, 44: 2769 (Nov. 15), 1929.

**Do Baking Powder Residues Exert Injurious Effects upon Growth and Nutrition?**—References are made to the conflicting statements in the literature particularly by recent investigators on the effects of compounds of aluminum on the human organism. References are also given as to the adverse effect of tartrates. On account of this uncertainty the authors have under-

taken this work to determine the possible injurious effects of certain baking powder constituents.

Three different types of baking powder were studied—those in which the acid reacting agents were (1) a tartrate, (2) calcium acid phosphate, and (3) calcium acid phosphate and sodium aluminum sulphate.

Young rats in 4 groups were placed on a diet complete in dietary factors and varied only in respect to the addition of the baking powder ingredients in 3 groups, the fourth serving as a control.

The powders added conformed as closely as possible with the manufacturer's directions, corresponding correction being made for the food materials used. Carefully mixed ingredients were made into a dough, rolled thin and baked at a temperature of 230° C. The bread was readily consumed by the rats and given *ad libitum* with the addition of 20 gm. head lettuce per rat every 4 days. At the end of 220 days certain animals were bred and the young at weaning were put on identical diet except that in each group the proportion of baking powder to food was doubled. At the end of the feeding test both generations were killed, blood analyzed for non-protein nitrogen; kidneys were weighed and examined histologically.

Complete tables are given for both generations as well as graphs showing the growth curves. Food consumption was relatively high but kidney weights indicated no hypertrophy. Microscopical examination of kidneys showed no difference between the controls and those on the baking powder diets. No differences were noted between the non-protein nitrogen of the blood except in one isolated individual. Growth curves for all series show normal gain in weight except that those on the phosphate powder gained slightly less than the rats of the corresponding sex on the other three rations, but the difference is insignificant. Even more rapid growth was

noted in rats of the second generation consuming twice the amount of baking powder.

Compared to a 70 kilo man the amount of powder ingested by the rats would approximate 42 gm.  $P_2O_5$  in the phosphate powder, 8.9 gm.  $P_2O_5$  and 2.5 gm. Al in the phosphate and aluminum powder and 30 gm. of tartaric acid in the tartrate powder. In this connection it is noted that the largest dose of aluminum employed by the Reference Board was 1 gm. per day.

Reference is made to the report of Schaeffer, *et al.*, *Bull. Soc. Sci. d'Hyg. Alim.*, XVI, 1928, on a sodium aluminum sulphate and calcium acid phosphate baking powder attributing to the ingestion of this ingredient such effects as gastric evacuation, intestinal ulceration, diarrhea, and inhibition in growth.

The report also stated that rats less than 90 gm. weight were not resistant to the baking powder, but in the present work most of the rats were under 65 gm. when the diets began.

Discrepancies are attributable to excessive amounts of baking powder used by Schaeffer, one diet containing 15 per cent, since a similar proportion of necessary dietary factor such as salt might produce untoward results. The conclusion is reached that with the types of baking powder employed and in the proportions stated there is no evidence of any deleterious effects whatsoever on the experimental animals and that they are comparable in every way to the control

rats.—William A. Rose and Florence L. Catherwood, *J. Nutrition*, 11: 155 (Nov.), 1929.

**Vitamin A Content of the Green and White Leaves of Market Head Lettuce**—It has been previously shown (*A. J. P. H.*, 17: 1193 (Nov.), 1927) that the vitamin A content of head and leaf lettuce varied with the greenness of the leaves. The experiment here reported was undertaken to show the degree of differences in vitamin A content in outer green leaves and inner white leaves.

California head lettuce of the Iceberg variety, purchased in a market in Kansas, was used. Only leaves which were totally unfit for human consumption were discarded, and the heads were wrapped in damp cloths and kept in a refrigerator.

Albino rats, 4 weeks old and of similar weights, were used. When the stored vitamin A was depleted, the animals were given, in addition to the vitamin A-free diet, weighed amounts of inner white leaves and of outer green leaves and growth was observed for 8 weeks.

It was found that the green outer leaves of head lettuce contained 30 or more times as much vitamin A as equal weights of the white leaves, the unit for the dark leaves being between 0.015 and 0.02 gm., and for the white, 0.6 gm.—Martha M. Kramer, Gladys Boehm, and Ruth Esther Williams, *J. Home Econ.*, 21: 679 (Sept.), 1929.

# PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.\*

**Qualifications for Industrial Nurses**—Florence Swift Wright, R.N., has written *Industrial Nursing*, a book which is a classic in this specialized field of public health nursing; yet of 15 industrial nurses who gathered at a dinner in a middle western city a short time ago, not one had ever heard of the book.

As Miss Wright says, most industrial nurses enter the plants of their employers by way of the first aid rooms. There are still some school nurses who do nothing but first aid work, but the school authorities are fast learning that first aid is only one of the ways in which the school nurse finds opportunities for service; and the time is coming when industrial concerns will find that the value of the industrial nurse to both employer and employee steadily increases as she enters the field of prevention.

The New York State *Health News* for October 21, 1929, states that at the New York State Annual Conference of Health Officers and Public Health Nurses, Grace M. Heidel, Supervisory Nurse for the New York Central Railroad lines, drew up some conclusions regarding the qualifications for nurses doing public health work in industry. They are:

1. Minimum course in public health nursing with practical field work, if possible (4 months at one of the universities giving an approved course in public health nursing, or 8 months on the staff of a public health nursing association under good supervision is the minimum standard set by the National Organization for Public Health Nursing).

2. Understanding of the principles of social service and mental hygiene.

The young nurses just out of training,

\* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

to say nothing of the practical nurses many industries consider satisfactory, have had no chance to acquire these minimum qualifications for their positions. Of 26 industrial nurses present at the meeting where Miss Heidel spoke, only 2 had had any training in public health, and only 3 had done any visiting nursing. Two were not even registered nurses.

Despite the fact that there are wide fields in the ranks of industry for public health nurses to teach the workers how to care for their own health, these opportunities are almost everywhere apparently being lost, either because the industrial nurses themselves do not see what is lacking or because the employer has never been shown what a real preventive program carried out by a real public health nurse could do for his plant.—Florence Swift Wright, *Industrial Nursing*, 1928, p. 7. *Health News*, New York State Department of Health, Qualifications for Industrial Nursing, 167 (Oct. 1), 1929.

**The Passing of Anna McGee**—a Pioneer Public Health Nurse—Public health nursing is such a comparatively new profession that it has not many outstanding older nurses among its ranks. One of them was the late Anna McGee of Schenectady, N. Y., who at the time of her death on October 28 was Director of the Schenectady County Public Health Nursing Association.

Dr. Julius Tandler, Health Commissioner of Vienna, Austria, who gave an address at the International Congress of Nurses in Montreal this summer, remarked that if he had his life to live over again he would like to be an Amer-

ican public health nurse because of the romance and human interest of her work. This is well borne out in the life of Miss McGee, which must have been full of romance and adventure.

She was doing private duty nursing when she made the acquaintance of Theodore Roosevelt, who was organizing his regiment for the Spanish-American War. She volunteered her services, and was the first woman to enlist for foreign service. Later, President McKinley put her in charge of the American hospital in the Philippines. She was assigned to duty under Admiral Dewey and was on his flagship, the *Olympic*, when the vessel steamed into the harbor of Manila.

She was transferred to Cuba where she did duty on the battlefield at San Juan Hill.

Soon after she returned to the United States she was assigned for duty with the Ninth Infantry, which was ordered to China to quell the Boxer uprising.

Returning to the United States she joined with Lillian Wald, the founder of the Henry Street Settlement Nursing Service in New York City.

During the World War her services were very valuable in the recruiting of nursing forces for service in this country and in France.

She was always an ardent Red Cross worker in her local chapter. She was an active worker in the Schenectady Federation of Women's Clubs, and was chairman of the public health nursing committee of the New York State Federation of Women's Clubs.

Miss McGee was a charter member of the National Organization for Public Health Nursing, and was affiliated with the Public Health Nursing Section of the A. P. H. A.

**She Is a Teacher-Nurse**—It seems difficult for a great many people to understand the work of the public health nurse unless they have had some vital contact with it or been very closely as-

sociated with it over a period of time. Some feel that public health nurses are not graduate nurses because they wear blue or gray instead of white uniforms. One college student whose instructor took his class to visit the office of the local public health nursing association, exclaimed afterwards to the instructor, "I'm so glad you took us down there. I have often seen those nurses on the street, but I always thought they were nuns."

In the November, 1929, issue of *The Survey*, Dorothy Deming describes the work of a public health nurse in a way that entertains while it informs.

In answer to the query, "What's public and what's healthy about a public health nurse?" from a young friend just recuperating from a tonsillectomy, who had for the first time that morning received the ministrations of a public health nurse in her home, the friend who had stepped in for an afternoon call and who had recommended a visiting nurse answered:

The public health nurse is a teacher and nurse, with a nicely balanced ability to do one or the other as the situation demands. If Mrs. Hardemup has broken her ankle and needs the skilled care of a graduate nurse only once a day, she calls for the nurse and scarcely gets a glimpse of the teacher. On the other hand, if Mrs. Poormother doesn't know how to launder her new baby, the teacher section of the nurse appears, and she gets a lesson in baby bathing. Most of the time the public health nurse isn't conscious herself which ability she is using, nor is her patient. It's just one big inseparable job.

In answer to the girl's complaint that her nurse that morning had not taught her a thing, the visitor explained:

She taught you how to read your clinical thermometer. . . . She fixed your light for night reading in a way you have never thought of. She wrapped your icebag so it wouldn't drip on your pillow, left a list of foods you can eat, wrote out that recipe for milk whip, explained why your ears hurt, and you never knew she taught you a thing.

The girl was beginning to get an

inkling of how the nurse did her teaching, but the visitor went on:

Now picture that same nurse in the home of a poor tenement family. The mother knows about six words of English. Two of the eight children have influenza. The father coughs constantly and is out of work. There are no medical supplies in the house, not even a quarter for the gas meter—does

she have to know how to teach? Add to her home visiting, assistance at clinics, conferences, mothers' clubs, school nursing, nursing in industries, a few talents on the side, such as poster making, public speaking, committee management, automobile hygiene—and you have a nursing job *plus*.—

Dorothy Deming, *Nursing by Leg Power*, *Survey*, Nov., 1929, p. 205.

## EDUCATION AND PUBLICITY

EVART G. ROUTZAHN\*

**The Strange Case of Mr. Smith—**  
The reactions of "one who should know" are reported by B. K. Richardson, Illinois Department of Public Health:

Apropos of the diagnosis of the Strange Case of Mr. Smith at the Minneapolis Publicity Clinic. I placed a copy of this little booklet in the hands of my 8 year old boy. He read it through with apparent interest. His comment when he had finished it was "A bath would help, wouldn't it?" Then he wanted to know what the Joneses thought of getting Smith's cold.

**Will You Help East Orange?—**  
And what do you do with the public waiting room?

In the new Health Building recently occupied by the East Orange Health Department, we have provided what is known as a public information room. Here, most persons visiting the department will stop for directions or will wait while the information they wish is being secured. In other words, it will be a public waiting room, and it is our purpose to make it work and to be instructive as well.

Among other things we have a universal display standard with 30" x 40" panels for posters, charts, maps and other educational material. I would greatly appreciate suggestions from you as to just what to use and how to obtain it. It occurred to me that

some readers might help us to dress up these panels with practical public health educational material.—F. J. Osborne, Health Officer, East Orange, N. J.

January 22, 1930—This is the date when Chairman John Sundwall will meet the Public Health Education Section Council in New York. The docket will include the Fort Worth program and other Section interests.

**Recognition of Good Work Done**  
—Why should not health publicity claim one or more of the Harmon awards for the best records of a year's publicity? Making up the record should be good fun! And probably we will agree that such a record should be made anyway. Why not make up a duplicate set—for staff and board and publicity committee to study? Then permit the exhibition of one set at Fort Worth next October. The Harmon Foundation, 140 Nassau St., New York, will send you details.

**What Might Have Happened!—**

I almost had a heart attack when I failed to find your department in the August issue *A. J. P. H.* So when this month's issue arrived I looked for it first thing and heaved a sigh of relief.

\* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.



Please let me criticise now that I've thrown my bouquet. You have two and one-half pages of material in that issue. Why leave the precious half-page blank?—B. P. R.

Answer: Sometimes because the next month comes too soon; sometimes because the editor at 370 cannot easily fit the copy into the space. But it was good to learn that one man noted the omission of this department.

**Make Friends with Your Public—**  
Says J. Mace Address, Ph.D., in December, 1929, *Hygeia*, under "Health and the School":

A health program cannot hope to succeed unless it is looked upon in a friendly way by the rank and file of teachers. . . . A health program cannot hope to succeed unless it is regarded favorably by the general public. . . . There are also the parents. Their support is indispensable in the carrying on of the health program.

Then follow suggestions on relations with community leaders, parents and newspapers:

One of the striking measures in the child health demonstration at Fargo was the care with which the general public was informed as to the prospective health program and the spirit of civic coöperation that was aroused. From that point of view alone the report of the demonstration is worth reading with care.

**Who Is Right? Who Says So?—**  
Taking pity upon the public, *Hygeia* (Dec., 1929) says:

If a distinguished scientist even suspects that he has found, for example, a cure for cancer, that is big news. It gets a lot of space and a good headline. Perhaps the professor was unwise in letting his suspicions reach the press, but we cannot censure the press for making a big story of it. It is the biggest story waiting to be told in the realm of modern medicine. A few months later, the scientist finds that he has not come to a correct conclusion. This is not such big news, and though duly reported, it is often overlooked by the reader. We may perhaps wish that the truth might catch up with the error, but that is seldom the case in any field of human relationship.

Moreover, the real newspaper in its news columns is telling you what happened, not what it thinks about the event. If the professor says so and so, the paper reports it. When speeches are made at conventions or other gatherings, the press reports them if they are interesting or the man who makes them is important. It does not distinguish between sources; it may report in the same issue the statements, often widely at variance, of physicians, leaders of faith-healing movements, anti-vivisectionists and representatives of this or that cult that claims to deal with health. It is all news; you must do the sifting. The question to ask yourself is—Who says so? . . ."

Then Dr. W. W. Bauer, in "Who Says So—Health Educators or Health Racketeers?" describes the sources of reliable health information. Good material for further use. A second chapter in the January, 1930, issue.

**Who Uses Them?—**Bookmarks, bookplates, book covers—in schools or elsewhere? Do you issue your own, or do you purchase them ready-made, or secure them free from an advertiser of a health product? Replies will be passed on, and samples will be displayed at Boston and Fort Worth.

**The Alabama Movable School—**It consists of a large covered motor truck, operating out of Tuskegee Institute and carrying a crew of from four to six people, among whom are a federal farm demonstrator, two public health nurses, a home economics worker and the chauffeur. Possibly one or two others are also taken along for certain localities. All of the crew are colored. The county health officer or the county farm demonstrator or home bureau agent is notified in advance about the coming of the School. The truck drives up at a certain time in front of a farm which has been set aside for the purpose. Usually from 150 to 175 Negroes from the neighborhood are present. The male members of the School take the men out on the farm and go over it,

showing them how to prune trees, plant cotton, grow better stock, etc. The women from the School take the wives of the farmers and teach them how to cook, how to sew and how to make their homes look better. From the public health angle they teach them how to keep themselves and their families healthy. For example, they teach them how to take care of the baby, how to cook the food and how to take care of tuberculosis patients or others that are sick, etc., etc.

During the course of the demonstration the whole house and yard are cleaned up, whitewashed and a complete transformation is made during the day. The next day the School moves on to another locality and repeats its demonstration. In this way the people are taught health and farm economics right on the ground. On Sundays the School puts up at some place where there is a church and usually the service is given over to health. As many as 700 people are reached in this way on a single Sunday.

The School carries material for graphically demonstrating the points they wish to make and everything is presented in a manner that will be effective and will reach the Negro farmer to whom they appeal.

The enterprise is supported jointly by the Tuskegee Institute, Alabama State Department of Health, U. S. Bureau of Agriculture and the Alabama Tuberculosis Association.—Philip P. Jacobs.

The School will be demonstrated at the National Tuberculosis Association convention at Memphis in May, 1930.

#### DIPHTHERIA

The Search for the Unprotected Child in Chautauqua County (without name of agency or city address). Two pages of "Some Endorsements from Chautauqua County People."

Small 4-page folder—Knock Out Diphtheria. Cover page: photograph,

white on black, with black on white silhouette—different, effective. Inside: white on black photograph, with conversational text. Racine Health Department. Better send 2 cents for copy.

Philadelphia's 1929 diphtheria campaign described in *Monthly Bulletin*, Department of Public Health, Philadelphia, Pa. Among the publicity features were a series of six announcements, each about 100 words in length, given by several radio stations during the 10 days of the campaign; free advertising space in several dailies; 1,000 large red and blue posters distributed by a motion picture company; free advertisements in motion picture programs for a week.

#### READING REFERENCES

Eighty-five references to books, chapters and articles are given in *Supplement to Publicity Methods Reading List*, under such headings as: The Public and Public Opinion, Copy, Exhibits, Financial Campaigns, House Organs, Lists, Mail, Meetings, Motion Pictures, Newspapers, Plays and Pageants, Posters, Printing, Public Speaking—and publicity in special fields, including Public Health.

The 1924 edition includes 48 pages of references listed under 29 headings. Both for 30 cents. *Copy of the Supplement free upon request by all who already have copies of the 1924 edition.* Russell Sage Foundation, 130 E. 22d St., New York, N. Y.

#### WORDS—"HUMANIZED"

The *London Mercury*, speaking of the new *Encyclopedia Britannica*, which had to be "humanized" to meet the requirements of the large mass distribution in the United States:

... and "humanized" in a very large proportion of the work—and that not the least scholarly—has simply meant plain English, and a merciful brevity, and a few explanatory words now and then to help the ordinary reader over some style.

## SLOGANS AND PHRASES

"Knock out diphtheria"—Racine Board of Health.

"Protect them from tuberculosis" (with child picture)—Early Diagnosis Campaign, 1930.

"Spare the sweets and save the teeth"—Extension Division, University of Iowa.

## HONORABLE MENTION

To Department of Health, Morristown, N. J., for table of contents in annual report.

To *Missouri Public Health News*, State Board of Health, Jefferson City, Mo., for table of contents.

To Board of Health, East Orange, N. J., for table of contents in annual report.

To Marion County Tuberculosis Association, Indianapolis, Ind., for title of annual report—"Progress in Public Health in Indianapolis and Marion County."

To Public Welfare Commissioner, Philippine Islands: for table of contents in annual report (plus heavy demerit for mailing report rolled).

To American National Red Cross: for a good table of contents in annual report.

To *Public Health News*, New Jersey Department of Health: for an index for the year.

## RADIO

Tell us of your radio dates ahead, with or without the specific topics?

Station WEEI will broadcast for the Massachusetts Society for Mental Hygiene on alternate Mondays at 2:30 p.m., eastern time: Dec. 2, 16, 30, Jan. 13, 27, Feb. 10, 24.

Probably the A. M. A. will continue broadcasting at 11:15 and 8:00 p.m.,

central time; Station WBBM (770 kilocycles—389.4 meters).

From the code of ethics adopted by the National Association of Broadcasters:

This radio station agrees that patent medicines or products of any kind, the use of which without the advice of a physician may prove dangerous to the health or physical condition of a user, shall be permitted time on the air only when competent medical authorities have approved them.

Caring for the Health of 6,000,000 People, by Homer Folks, over WEA, October 30. Free from Health Department, New York, N. Y. A good showing of what a health officer or health department must do. Can be adapted to other cities.

Passing Things Around (colds are communicable), radio talk broadcast by Onondaga Health Association, 327 Montgomery St., Syracuse, N. Y. A good example of a "good" radio talk. Free for 2 cents.

## DATES AHEAD

The April, 1930, Early Diagnosis Campaign will emphasize "the importance of watching and guarding the child." Inaugurated by the tuberculosis associations, this campaign offers an opportunity for many types of health agencies to participate. Address any local or state tuberculosis association, or the National Tuberculosis Association, 370 Seventh Ave., New York, N. Y.

## WORDS

We say "physician" to distinguish between the cult doctors and the physicians. Too often with ignorant people our saying "doctor" means any old kind of a doctor, herb-doctor, advertising quack, or what not. The rest of your cracks on words I agree with.

This, from Bernard P. Roloff, director of health education, Chicago Department of Health, sounds reasonable.

## BOOKS AND REPORTS

Laboratory Methods of the United States Army—*Manual of Laboratory Methods* (3d ed. rev.), *Medical War Manual No. 6*—Edited by Charles F. Craig, M.D. Philadelphia: Lea and Febiger, 1929. 696 pp. Price, \$3.50.

This excellent manual appears under a new name, and is practically a new book. It covers an enormous amount of ground, and in all shows a high degree of excellence. There are some omissions, as Kinyoun's modification of Ponder's stain for diphtheria. We cannot but consider it unfortunate that the method of the Wassermann test given is so different from that in general use. In the reporting, (+ +) represents the highest mark given, indicating complete inhibition of hemolysis. This conforms to the recommendations of the second laboratory conference held in Copenhagen in 1928. An antihuman hemolytic system which requires an excessive amount of complement is used, while the measure of amboceptor necessitates cutting pieces of paper of exactly the same size. Incubation is at 37° C. rather than at icebox temperature. The higher temperature is apt to injure complement and gives more opportunity for non-specific reactions, in addition to which the lower has been found to give stronger reactions with syphilitic bloods. While (+ +) is the highest mark for the Wassermann, 4 + is used for the Kahn method.

The author, page 186, recognizes that the method adopted by him is less sensitive than that in general use in civil laboratories.

When committees both in Europe and in this country are trying to standardize this test, and to approach a certain degree of uniformity, it seems unfortunate

that a much used and official book should add to the existing confusion. There is no mention of the fact that this is not in accordance with widespread practice.

With a few exceptions, nothing but praise can be given to this manual, both as regards its substance and its make-up.

M. P. RAVENEL

The Chemical Aspects of Immunity—By H. Gideon Wells, Ph.D., M.D. (2d ed.) New York: Chemical Catalogue Co., 1929. 286 pp. Price, \$6.00.

This second edition of an American Chemical Society monograph has been enlarged to include the contributions to immunological knowledge of the past 5 years by the incorporation of new material into the various chapters without increasing their number. As with the previous edition, the underlying idea has been to bring together in the most concise manner possible the best of the facts and theories of immunity for the use of both chemists and immunologists.

This edition will undoubtedly be as widely used as the first, which was translated and published in French and German.

ROY W. PRYER

The Road to Health—By C.-E. A. Winslow, Dr.P.H. New York: Macmillan, 1929. 155 pp. Price, \$2.00.

This is a book written by one who is no propagandist, and who is more than a technician, having the ability to present to us the philosophy of the health movement so that we may see the whole field clearly with him. It covers, in three chapters, the story of the conquest of disease, the dominant phases of the present-day program, and the perplexing problems of the new public hygiene, es-

pecially physician-patient-health agency relationships.

The book is made up of a series of three lectures given presumably to a well educated lay audience. The presentation is convincing, the style pleasing, and it cannot fail to interest and delight readers of the same type as the audience to whom the lectures were addressed.

It is to be regretted that the publishers did not make the book more attractive with illustrations. Reproductions of pictures showing the sanitary measures of older days stimulate interest when contrasted with present-day practice. Simple graphs would have made the few comparative statistics used more comprehensible.

Evidences of lack of editing creep in—for instance, "half the states of the Union (including Pennsylvania) . . ." suggests that this state is inhabited by strange creatures who would not be expected to conform to rational practices. Statements such as "perhaps few of us even in this room" encumber the text.

However, these minor faults mean but little, for the philosophy is so sound, the presentation so convincing, the style so delightful that the book will influence profoundly all those who have better than "tabloid" minds.

R. S. PATTERSON

**A System of Bacteriology in Relation to Medicine (Vol. III)**—By W. Bulloch, P. Fildes, A. T. Glenny, H. Henry, R. T. Hewlett, R. A. O'Brien, S. G. Paine, G. F. Petrie, Muriel Robertson, R. St John-Brooks, W. G. Savage, A. C. Thaysen, H. G. Thornton, and R. L. Vollum. London: His Majesty's Stationery Office, 1929. 413 pp. Price, \$6.00.

The announcement made some months ago that the Medical Research Council of England would sponsor the publication of *A System of Bacteriology in Relation to Medicine* in 9 volumes was

hailed by all bacteriologists, especially those in English speaking countries, with great satisfaction. Since the creation of the Council, it has been responsible for many notable studies. Certainly no one group has contributed more to bacteriology and many phases of medicine than the Council.

While we have many excellent books on bacteriology in its various relations to human and animal medicine, to agriculture, and to various commercial arts, there is now no system at all comparable to what the Council has projected. We understand that it is to be carried out by some 100 British bacteriologists under the general editorship of Dr. Paul Fildes and Professor J. C. G. Ledingham, who are acting on behalf of the Bacteriological Committee, of which they are members; but which contains in addition the names of other well-known men, so that we are assured of an authentic exposition of the science as well as expert presentation.

The first volume published is No. III. It opens with a chapter on The Economic Aspects of Bacteriology, followed by 11 others, which treat of the bacteriology of water, dairy industry, foods, food poisoning, soil, insects and plants. The diseases treated are bubonic plague, gas gangrene, and tetanus. Each chapter is followed by a well selected bibliography. The presentation, as well as the editing, has been exceptionally well done. The educated Englishman knows his language.

It surprises one to find only 11 pages given to the bacteriology of water, and 23 to the dairy industry, though it must be confessed that it is a relief to have known facts presented succinctly, without the long discussions sometimes found, and which generally result only in confusion. The bibliographies before mentioned point the way to fuller discussion if deemed necessary.

A striking feature of the book is the paucity of illustrations. Only Chapter

V on Soil Bacteria is illustrated. While a book can be overloaded with charts and figures, they are of great assistance in the understanding of certain subjects. One wishes particularly for illustrations of insects and of the organisms associated with gas gangrene.

The Table of Contents is full, and must serve as an index until Volume IX is published, which will contain a general index of the series.

We cannot but feel that the Medical Research Council has put all bacteriologists under a further debt of gratitude, and we congratulate the editors as well as the individual authors upon their excellent work.

M. P. RAVENEL

**Some Methods for the Prevention of Tuberculosis**—By *W. Bolton Tomson, M.D.* New York: *William Wood*, 1929. 148 pp. Price, \$2.50.

Methods for the control of tuberculosis may be grouped into (a) devices for preventing massive infection and (b) attempts to inhibit the development of disease after infection has taken place. Dr. Tomson has collected in one volume several of the tested measures employed in European countries and in the United States.

The Grancher system, practiced mostly in France and Belgium, is based on the observation that children of tuberculous parents are in grave danger of becoming massively infected and later diseased, and advocates the separation of children from their parents until they have acquired a reasonable amount of immunity. The Grancher principle is applied most drastically by the Placement Familial des Tout-Petits, which arranges for the complete separation of the new-born infant from its mother. The child is cared for at a maternity clinic for about 3 years, after which it is boarded out in a peasant family free from tuberculosis. Of 434 children so cared for in 1927, only 1 died of tuberculosis.

In Switzerland, children are not boarded out in families but are placed in preventoriums. Norway and Sweden have developed well rounded programs for the prevention of tuberculosis, in which nursing homes for tuberculous children, open air schools, and improvement of housing conditions, play important parts. In England, prominence is given to the view that infection may be prevented from developing into serious disease by raising the bodily resistance and by diminishing the strength or sizes of the infecting doses. Tuberculosis Village Settlements, such as Papworth at Cambridgeshire and Preston Hall at Aylesford, have demonstrated, according to Dr. Tomson, the feasibility of colonizing tuberculous adults and their families.

The description of some of the measures in vogue in the United States leaves much to be desired both in accuracy of presentation and point of emphasis on the methods selected for discussion.

Dr. Tomson strongly advocates the adoption of the Grancher system for his own country, England, but realizes that public sentiment is strongly opposed to the radical separation of children from parents. American health workers will do well to give careful consideration to the technics described, even though they may not seem suitable to our conditions.

H. E. KLEINSCHMIDT

**Laws Concerning Birth Control in the United States**—*New York: Committee on Federal Legislation for Birth Control*, 1929. 39 pp. Price, \$.25.

According to this pamphlet, presenting a survey of federal and state legislation on birth control, 31 states now have laws permitting physicians to give information on the prevention of conception, while 11 others permit the giving but not the publishing of the information, and 2 states allow it for the cure and prevention of disease. Four states

are said to be doubtful, and 1 prohibits the information. Following a preface by Margaret Sanger, in which birth control is characterized as a beneficent social force, the various state laws are tabulated, and briefly discussed. The pamphlet will be of interest to those who are either for or against this so-called social force.

JAMES A. TOBEY

**Meat through the Microscope. Applications of Chemistry and the Biological Sciences to Some Problems of the Meat Packing Industry—By C. Robert Moulton, Ph.D. Chicago: University of Chicago Press, 1929. Price, \$5.00.**

This book is one of the Institute of Meat Packing Studies, and is the outcome of a series of lectures given by the author in the school year 1923-1924, though it contains much new material, and may be regarded as a new work.

The name is misleading, as it considers the problems of chemistry, bacteriology, and other biological sciences as related to the meat packing industry. As a textbook for those going into this business, it possesses great value. Health officers should also have knowledge of much of the material presented.

The treatment of meat curing and meat spoilage, which occupies more than one-third of the book, will be of value to many readers, though it is too technical for the general public. The chapter on "Pharmaceuticals and Glands" is of particular interest, showing how large a part the stockyards of today play in the provision of these comparatively new products, much used, and much abused, in rational medicine as well as quackery.

The book is well and interestingly written, and a fair division of space is given to the subjects considered. The last chapter, "Health Problems," while it contains useful information, is not complete enough to be of much value. One cannot help wondering why un-

dulant fever, septic sore throat, ergotism, milk sickness, potato poisoning and fish poisoning should be treated in a book devoted practically entirely to packing house problems, and in the same chapter 11 pages are devoted to the cattle grub, which, while it interferes with the proper growing of cattle, seems to be of interest to the author chiefly because it injures the hides.

The book is excellently printed and bound, and very free from mistakes.

M. P. RAVENEL

**Behavior of the Young Child—By Ethel B. Waring and Marguerite Wilker. New York: Scribner, 1929. 121 pp. Price, \$1.00.**

In the book, *Behavior of the Young Child*, by Ethel B. Waring and Marguerite Wilker, the two important subjects of sleeping and feeding with relation to young children are considered in terms of practical experiences related and interpreted. The behavior of children in relation to both of these subjects is considerably varied and important.

Many mothers who think they have peculiarly unique problems will probably gain a great deal of information and assurance through seeing in new relationships their own problems. It is extremely important for the adult to understand the underlying reason which exists in the mind of the young child and which determines his behavior.

We cannot always be sure that the behavior approved by adults is necessarily best for the young child. Sometimes very serious defects occur in the child's behavior because of the disapproval expressed by adults who do not fully appreciate the fact that each age group has its own behavior code which often meets the approval only of its own age group. Many a child is today not eating or sleeping because of insistence upon his sleeping or eating in a way which meets only adult approval. This

is a point, I think, 'brought out in the examples cited in the book.

Adults whose experience has been very limited in the care of young children should benefit greatly by seeing the variety of responses that can occur in a single situation. The distinction is clearly made between what we really do teach the child and what we wish to teach the child. The book is helpful and instructive. LEROY A. WILKES

**Rickets Including Osteomalacia and Tetany**—By *Alfred F. Hess, M.D.*  
*Philadelphia: Lea and Febiger, 1929.*  
485 pp. Price, \$5.50.

Few subjects have held the interest of the scientist and medical man during the last ten years more closely, and few have brought more surprises in their solution, than rickets. The author was led to his study of the disease incidentally during the investigation of infantile scurvy, but for the past 12 years has given his attention both in the clinic and laboratory to its investigation.

Though rickets was satisfactorily described by Soranus of Ephesus, who lived in the early part of the Christian Era, the author divides our concept of the disease into two periods—1650 to 1918, and the second, which he calls that of the "Newer Rickets," from 1918 to the present. The date 1650 was presumably selected because in that year the work of Glisson which "will always remain one of the glories of English medicine" appeared.

Rickets is regarded as essentially a climatic disorder. Its distribution throughout the world is inversely proportioned to the amount of sunshine. "In general, a map of the incidence of rickets is the practical equivalent of a map of deficiency of sunlight." This justifies the statement that had physicians during the World War known of the specific value of sunlight or of ultra-violet rays, the so-called "war osteomalacia" would not have flourished.

The study of the disease has also brought about other remarkable discoveries, such as the activation of cholesterol, and the further discovery that ergosterol was really the substance concerned. The remarkable effects of the ultra-violet light have also been demonstrated to such an extent that "Rickets has become the established criterion for appraising the biological action of ultra-violet waves in the region of 300 millimicrons."

The author has produced what we consider a complete book in spite of his apologies for some omissions. There are few questions which remain unanswered. From the standpoint of our readers, the prevention of rickets with its resulting deformities will prove the most interesting feature, but this has, of course, depended upon the experimental and practical studies described. A clear understanding of all the factors involved is especially important on account of the commercial exploitation of irradiated foods and irradiation in general.

Osteomalacia and infantile tetany are also capably considered. We cannot but consider this a book of unusual importance, both as regards subject matter and treatment. It will for a long time hold its place as a standard.

There are few illustrations, but there is a well selected bibliography. The printing and make-up are of high quality.  
M. P. RAVENEL

**Federal Limitations upon Municipal Ordinance Making Power**—By *Harvey Walker.* *Columbus: Ohio State University Press, 1929.*  
207 pp. Price, \$3.00.

Among the many technical requirements of ordinance making is the essential one that the ordinance must conform to all provisions of the Federal Constitution. The several limitations imposed by our supreme law, and the interpretation and application of them



as revealed in the numerous decisions of the Supreme Court of the United States have been compiled, documented, and studiously set forth in this well printed book. It does not contain much specifically on the subject of public health, though half a dozen pages are devoted to a discussion of local health powers in relation to the Fourteenth Amendment to the Constitution. Lawyers, legislative drafting experts, and others concerned with the legal technic of ordinance making will find this book of value for reference and study.

JAMES A. TOBEY

**Water Supply Engineering**—By *Harold E. Babbitt and James J. Doland*. New York: McGraw-Hill, 1929. 776 pp. Price, \$6.00.

This up-to-date textbook has been prepared in such a way as to combine both fundamentals and practical procedure. The limitations of space and cost have, of course, prevented exhaustive treatment of each subject, but sufficient is given to fulfil the purpose of the volume. It is believed that the readers will be struck particularly with the logical arrangement of the subject matter.

After a brief introductory chapter and one on finances, there follow two good ones on hydraulics and rainfall and runoff. As these two subjects are important ones to the student, they are given more space than some other subjects. Dams, impounding reservoirs, intakes and aqueducts are given 71 pages, while steam and electrical power, together with pumping machinery, receive 113 pages or a little more than one-seventh of the book. Because of the extensive use of electricity as power, the chapter on the utilization of that power is appropriate.

The next group of chapters covers materials, pipes, and the design and maintenance of distribution systems and reservoirs. This leads into a series of

chapters covering 224 pages on sanitation, and water quality and its purification.

The book has a good table of contents and is well indexed.

ARTHUR P. MILLER

**The Doctor in Court**—By *Edward Huntington Williams, M.D.* Baltimore: Williams & Wilkins, 1929. 289 pp. Price, \$3.00.

This is not a law book, but a story book. It is full of absorbing anecdotes from the experiences of a doctor who has frequently been in court during the past 40 years. The author belongs to the phratry of alienists, and admits it. As a consequence, most of his narratives are concerned with legal processes affecting the insane, particularly on the west coast. His discussions of the many incidents in his own career as a medical witness, and the appearances of other clever alienists before equally dextrous attorneys, are tinged with numerous ironical comments on the technicality, trickery, and quibbling with which the layman thinks our legal system is infested. Not so much is said about some of the patent imperfections, defects, and inconsistencies of medical science and its representatives, especially when on the witness stand.

Be that as it may, this is a particularly interesting book for any kind of a reader. The pleasure of perusing it, which is considerable, would be enhanced if the publishers had not made the reader cut so many of the pages. The print, paper, and make-up are all excellent, though judging from what is an unusual number of typographical errors for this publishing firm, the author is a better alienist than proofreader. Every physician and every sanitarian who ever has appeared in court, or expects to, and that includes nearly all of them, will find this volume both valuable and interesting. So will the general reader.

JAMES A. TOBEY

**Biological Stains—A Handbook on the Nature and Uses of the Dyes Employed in the Biological Laboratory.** (2d ed. rev.) *H. J. Conn, Chairman.* Geneva, N. Y.: *Commission on Standardization of Biological Stains*, 1929. 224 pp. Price, \$2.50.

In the preface it is stated:

... in the four years since the first edition of this book was published so much has been added to our knowledge of stains and staining that a large portion of what was then written is now out of date. As a result it has been almost necessary to rewrite the book in revising it. At the same time a good deal of new material has been added.

The improvement, which is significant, lies in the new material. A fairly close comparison with the first edition shows no essential changes from, or deletions of, any part of the contents of that edition despite the claim that a large portion is now out of date. Fortunately the book is better than the preface indicates in this respect, inasmuch as the essential features are still not out of date.

A section on acridine dyes has been added; those xanthene dyes which have come into prominence as indicators are more fully considered; a table of dye solubilities in water and in 95 per cent alcohol is included; and 2 pages of general laboratory information are appended which give the solubilities of certain compounds much used in microscopic work, formulas for fixing solutions and a cleaning solution. The chief addition so far as value is concerned is the including of detailed staining formulas and procedures under the various dyes as well as the general amplification of the list of dyes mentioned in detail. For many this will significantly enhance the value of the book.

To the theoretical portions of the book little if anything has been added, and little significantly altered. Very fortunately, the successful application of staining processes is not dependent on

a knowledge of their mechanism. If this were not the case, there would be little help offered in those chapters which treat on mechanism—either general or of the formation or action of compound dyes. One feels that a more definite knowledge of the types of valence bonds recognized by chemists would have been of aid. Though the confusion of the reaction of a solution with "basicity" or "acidity" of a compound is less evident here than in much biological writing, a trace of it remains. A certain limitedness of physical and chemical outlook is evinced throughout these particular chapters, an instance of which is the naïve statement (p. 161) indicating that the phenomenon of adsorption is the property "possessed by a solid body" rather than one characteristic of any type of interphase, even though the latter definition would aid the argument unless one assumes stained tissue as almost invariably solid.

The book is valuable as a compend of practical information, but the theoretical chapters should be read with an open mind, even if with interest.

The pointing out of these weaknesses does not detract from the general value of the book, and we feel that all of those interested in stains and staining owe a debt of gratitude to the Commission, and especially to its chairman.

A. E. STEARN

**A Manual of External Parasites—**  
*By Henry Ellsworth Ewing, United States Bureau of Entomology.*  
Springfield, Ill.: *Charles C. Thomas*, 1929. 225 pp. Price, \$4.50.

The five major groups of external parasites, the mites, ticks, biting lice, sucking lice and fleas, are treated in a technical yet readable manner. The manual gives a very good background for the study of these different groups. Original keys to the known genera of the world are given in most instances. These together with other essential

taxonomic matter and the consideration of external anatomy, life histories, natural relationship and economy make the book a valuable guide and reference for students of these groups. While it is intended more particularly for biological students, the manual will serve as a valuable reference for the general practitioner and the specialist in skin diseases and external parasites. Those interested in the veterinary sciences will also find it very valuable to them in their work.

The average layman will be particularly interested in the discussions and recommendations on the control and prevention of annoyance from the common chiggers. The chapter on parasitic mites has been handled in a masterful manner. Stockmen and poultrymen will be especially interested in the chapters on ticks and the biting and sucking lice. These three groups have been handled in a very satisfactory manner. The chapter on fleas will interest all who have ever had contact with this most annoying group of parasites.

The systematic arrangement of subject matter, the keys and excellent illustrations, mostly original, combine to make this brief manual a most valuable and acceptable addition to the literature on the external parasites.

L. HASEMAN

**The Bureau of Prohibition. Its History, Activities and Organization—By Lawrence F. Schmeckebier.** Washington: The Brookings Institution, 1929. 333 pp. Price, \$2.00.

Here is one really dispassionate account of the federal bureau whose activities in enforcing narcotic and liquor laws seem occasionally to cause public agitation, apprehension, and excitement. Mr. Schmeckebier has set forth in an impartial, almost blasé, manner the brief history and the extensive organi-

zation and activities of the Bureau of Prohibition. In this well printed volume, there are also included a number of valuable appendices giving compilations of laws and other useful data. There is a good index.

Physicians concerned with the intricacies of dispensing medical alcohol and narcotics will find this tranquil contribution to a turbulent subject a valuable reference work.

JAMES A. TOBEY

**Report of the Second Laboratory Conference on the Serodiagnosis of Syphilis—League of Nations, Health Organisation, Official No. C. II. 726. III. Health, 1929, III, 3. Boston: World Peace Foundation. 186 pp. Price, \$1.00.**

Considering the number of methods available for the serodiagnosis of syphilis, it is no small problem to select one for use in the average laboratory. Usually the choice depends on anything but a careful comparison of those in common use. It must be with some disappointment that the laboratory director, desirous of having the best, views the report of the Conference on the Serodiagnosis of Syphilis. The Conference was held for the purpose of making a comparative study of the various methods in use. Thirty-seven workers from 19 countries applied 1 of 16 tests to the serological detection of syphilis in 944 serums. The results, together with the clinical diagnosis on the patients from whom the serums were obtained, are published in detail, but the comparison must be made by the reader himself. The Conference, if it made a comparison, found it impossible to recommend any single test, although it must have had an opinion, for it declared: "the best of these (precipitation tests) may be regarded as equal in value to the best of those which depend on fixation of complement."

Rather than present an opinion on

the matter, the Conference made a series of recommendations which, if they should be considered as the accomplishments of the session, would place it on a par with some disarmament conferences. Fortunately, one is privileged to study for himself the tables presented and draw his own conclusions. Hence, there may be a result other than the following, which are in brief the recommendations of the Conference:

1. Precipitation tests should be done only by trained serologists.
2. At least two different methods should be used.
3. The tests used should be checked by frequent conferring with the clinician.
4. A uniform method of reporting (+,  $\pm$ , —) should be used.
5. On reports should be printed certain warnings for aid in interpretation of results.
6. Clinicians should study closely the diagnostic and therapeutic implications of the reports.
7. Further comparisons of this kind should be made in the future.
8. The Danish State Serum Institute should distribute serums for comparative study; itself test serums, and act as an intermediary for the exchange of information.

That these recommendations have worth, although some of them are already actively challenged, is evident, but it would almost seem that as a net contribution of such an ambitious undertaking they are disappointing.

Aside from the recommendations the report submits the entire data accumulated, including, besides results, a summary of the technical details of the methods used, and statements from several workers explaining the apparent failures of certain tests.

The reader will find difficulty in reconciling the data with the recommendations of the conference. If there is any reason for saying "the best of the precipitation tests equal to the best of the complement fixation tests," it is found in data not presented in this report, for here it is so apparent that precipitation

tests were infinitely superior that American champions of complement fixation tests explain the discrepancies by complaining of the antiquated methods in use in Europe. Had Kolmer been present results would have been different, it is claimed. It is indeed unfortunate that the Kolmer methods were not included. The omission was not the fault of the Conference.

This report should certainly be in the hands of every person engaged in the serodiagnosis of syphilis. Aside from its value in tabulating results of a large number of comparative tests, it provides interesting reading for the philosopher.

N. W. LARKUM

*Eat and Be Happy—By Josiah Oldfield, M.D. New York: Appleton, 1929. 115 pp. Price, \$1.50.*

As if there were not a plethora of books on how to eat, this publishing firm has acquired one by an English writer. Judging from the result there was little, if any, justification for such temerity. Not only is this particular book no better than the average, which is non too good, but it is much worse. The erudition and modernity of the author is well displayed by the archaic statement that if a man "lives over a bad-smelling drain, he will be always suffering from some complaint or other." A chapter on rheumatism is distressingly naïve, while one on vitamins omits more of them than are described.

"Every food faddist," declares the author, "should be put upon a pillar as high as that of Simeon Stylites or hanged on a gallows as high as Haman's." Excellent advice, which if followed would have meant that this book would never have been produced. It is indifferently printed and has no index. Considering its quality and quantity, or lack of both, the price asked for the book seems excessive.

JAMES A. TOBEY

# HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

White Plains, N. Y.—A birth rate of 23.7 per 1,000 population, with 78 per cent of the births occurring in 2 hospitals of the city, is the record of this city of 31,069 inhabitants for the year 1928. A general death rate of 11.9 and an infant mortality rate of 40 (24 for first month) are noted.

The medical service of the Department of Education supervises the health of school children at a cost of 62 cents per capita. A bedside nursing service with 8 nurses is maintained by the volunteer nursing association at a cost of 77 cents per capita. Hospitalization of indigent cases of contagious diseases, including venereal diseases and tuberculosis, is handled by the department of charities at a cost of \$1.72 per capita. The health department budget amounted to \$1.21 per capita. The health work of the city, scored on the basis of the second edition of the *Appraisal Form for City Health Work*, receives a rating by the health officer of 897, while the score on the third edition amounts to 783, the greatest difference occurring in the results in preschool hygiene work. The report contains excellent tables of vital statistics.

During the year there was conducted a toxin-antitoxin campaign by the health department in coöperation with the Board of Education, the Medical Society, the County Committee on Tuberculosis and Public Health, the Chamber of Commerce, the Nursing Association and the Parent-Teacher Association. Some 43 per cent of the preschool children, 83 per cent of children 5 to 9 years of age and 66 per cent of children 10 to 14 years of age received 3 immunizing doses. There was only 1 death from diphtheria of a child in White Plains during the year.

Attleboro, Mass.—One of the major health projects of the city of Attleboro is the health camp for undernourished boys, established in 1923 with the objective of developing boys mentally and socially as well as physically. In 1928 a group of 40 boys ranging in age from 7 to 14 and averaging 15.2 per cent underweight, was accommodated. The net gain during the 6 weeks of camp was 308 pounds, the maximum gain 12¾ pounds and the average gain 7¾ pounds. Posture work was an important feature of the camp program.

A noticeable decrease in the tuberculosis incidence and mortality is reported. In 1928 there were 74 cases with 24 deaths. Exclusive of non-resident cases the city had 8 cases with 6 deaths. This city of 21,330 people (estimated population) records a death rate of 12.6 per 1,000 inhabitants and an infant mortality rate, exclusive of stillbirths, of 61.5. Organic heart disease (30), pulmonary tuberculosis (23), chronic myocarditis (22) and cancer and cerebral hemorrhage (19 each), lead the list of causes of death for the year.

The health officer offers the following recommendations as a means of improving health conditions in the city: The appointment of a full-time milk and sanitary inspector, Appropriation for a properly supervised dental clinic, Isolation facilities for contagious diseases.

San Joaquin, Calif., District—A review of the operation of the San Joaquin local health district for the years 1923-1928 is highly enlightening. A local health district for administrative health purposes was formed by the county board of supervisors supported by representative citizens in 1923. This district provides for a governing Board

of Trustees who is concerned with the operation of the health department only. On this Board, each incorporated city has a duly appointed representative answering to the governing body which appoints him, namely the city council. The rural area is also represented by an appointee of the Board of Supervisors.

For the year 1927 a death rate of 12.17, an infant mortality rate of 61.7, a typhoid rate of 2.9, a diphtheria rate of 2.9, and a tuberculosis rate of 139.8 are recorded. Each of these rates is a marked reduction over the years preceding the formation of this coördinated district health program. Stockton, a city of over 50,000 people, completed 3 years without a death from diphtheria.

It is conceded that public health service does cost money—so do fire and police departments. While the latter two serve to some extent as life savers, it must be admitted they are more largely concerned with the protection of property. Property can be replaced—human life cannot. San Joaquin citizens believe in health conservation as a matter of economy as well as of humanitarianism.

**National Federation of Day Nurseries**—This biennial conference report is bound in attractive covers which immediately arouse interest, and cause the reader to turn the page and read the reports which prove to be most interesting.

The relation of diphtheria protection to nurseries, and the organization and functions of the nursery school are discussed at some length.

The nursery and nursery school have come to stay. Already the so-called privileged classes are clamoring for their children to have the daily opportunities, contacts, education and supervision of the nursery school, and now working mothers are glad to work harder that they may give to their little ones the same advantages.

In 1844 the first real "creche," or day nursery, was opened in Paris, supported partly by the city government and partly by private donations. Two years

later the Society of Creches was formed. Within 40 years, 67 "creches" were formed in Paris, 44 in the suburbs and 223 in the departments and colonies.

Since 1907, with the founding of the National Society of Day Nurseries in England, the day nursery there has taken on new life. All its nurseries are licensed and partially supported by government or municipal aid.

In the United States, the nursery began in Troy, N. Y., in 1856, and after 73 years it is still working and has an average attendance of 100 children a day.

**Jamaica**—The 1928 account of public health work on the island shows progress in the control of disease. "The Colony has learned that public health is purchasable and that a full realization of the benefits to be derived from health conservation can be found only in providing and maintaining well equipped health departments."

During the year the International Division of the Rockefeller Foundation co-operated with the government of Jamaica in rural sanitation and hookworm control, health education, school hygiene and dental clinics, a school for sanitary inspectors, a malaria survey, a tuberculosis survey and dispensary, and parochial health work. During the past 10 years, marked improvement has been made in living conditions as well as in public health, and expenditures of the central and local boards of health have more than doubled.

**Seeing Through Life**—This is the title of the annual report for 1928 of the National Society for the Prevention of Blindness. This is an unusually attractive report, concisely written, appropriately illustrated, and well printed on good paper, easily read. All but 12 states and one territory supply free prophylactic solution either to midwives or to doctors or to both, while 30 states

carry provision on birth certificates for reporting the use of a prophylactic in the eyes of the new-born. About 4 of every 10 birth infections of the eye that become a menace to vision are not gonorrheal in origin. Another fact of importance is the knowledge that treatment of the syphilitic expectant mother in the first 3 months of pregnancy is a safe assurance of her bearing a healthy child free from syphilis or any of its ravaging effects.

The number of sight saving classes in the United States has grown from 292 in 1927 to 305 in 1928. But it is stated that 4,700 more classes are needed. Factors of importance in sight conservation are cleanliness and care, periodic eye examination, adequate medical attention, and adequate and proper lighting. Prevention of accidents in play, safeguarding of industry, preschool eye testing and good habits of eye care are among the preventive factors emphasized. The experience of 583 industrial plants employing more than 578,000 men and women during 1926 and 1927 indicates that in the 2-year period, 2,757 men and women were saved from serious injury or total blindness in both eyes, and 4,654 were saved from serious injury or total blindness in one eye.

Willesden, England—The 53d annual report for the year 1928 shows an estimated population of 176,589, a birth rate of 15.1, a general death rate of 9.78, and an infant mortality rate of 57. At the municipal clinics, expectant mothers attended medical consultations on 2,376 occasions; nursing mothers, 11,336; and children under 5 years, 27,075; a total of 40,787 attendances. Of 2,666 children born during the year, 33.6 per cent subsequently attended welfare centers. A maternal mortality rate of 3.4 per 1,000 births is noted for residents.

The following groups of school children were medically examined: (1) All

children admitted to school for the first time; (2) All children between 8 and 9 years of age; and (3) All children between 12 and 13 years of age, together with children over 13 years of age who have not been examined on reaching the age of 12. There were 21,211 scholars on the public elementary school rolls, while the number of children medically inspected at routine and special inspections was 16,327.

The school nurses visited the homes of children having defects, 20,104 medical defects and 5,925 dental defects. Of those defects found to require treatment, medical or dental treatment was obtained for 14,391 and domestic treatment was obtained for 4,647. Some 88 per cent of the medical defects were treated, 63.5 per cent receiving medical treatment and 24.6 per cent, domestic treatment.

England and Wales—The annual report of the Chief Medical Officer of the Ministry of Health of England and Wales for the year 1928, like the previous reports from this source, is a highly enlightening and stimulating document.

In a word, preventive medicine means the organization of human nurture—the cultivation and health of maternity, infancy, childhood, adolescence, adult life, old age, the postponement of mortality; and such cultivation means not only the central and local provision of medical and sanitary agencies for the fuller control of morbid processes, but the development of the body and mind of man that they may reach, in each individual, the top of their capacity. Nothing is more certain than the fact that the physical advancement and health of mankind is dependent not upon a "doctor's stunt" here or a "sanitary institution" there, but upon the whole social environment and evolution of the people.

Four basic principles must be fulfilled; it is stated, before sound foundations of a national system of preventive medicine may be laid. There must be ascertainment and accurate registration of the data obtainable. There must be

a standard of health and physiology. It is desirable to formulate an average and a norm, primarily on physiological facts. There must be an ever-growing knowledge of pathology, the nature of disease, its character and incidence, its causes and predisposing conditions, its mode of spread, the social factors which increase or reduce it, and the means of its treatment and prevention. Finally, there must be national organization.

**Illinois**—During 1928 the 50th anniversary of the establishment of state public health service in Illinois was celebrated. This occasion was commemorated by holding in Springfield a special program participated in by distinguished sanitarians and educators. This anniversary was also the occasion for the

publication of a 2-volume history of health conditions and public health service in the state. A review of these historical documents has previously appeared in these columns of the JOURNAL.

The annual report for the fiscal year ending June 30, 1928, is abundantly illustrated with statistical charts of comparative death rates for the years 1920 and 1927. A general death rate of 11.4 in 1927 compares with a rate of 12.7 in 1920.

Under public health education it is noted that during the year, nearly 900,000 pieces of literature were distributed; 1,800 posters and 752 films were loaned, the attendance at meetings where films were shown being 336,700. A large portion of the report of 507 pages is devoted to vital statistics.

## BOOKS RECEIVED

**POSTURE AND HYGIENE OF THE FEET.** By Philip Lewin. National Health Series. New York: Funk and Wagnalls, 1929. 47 pp. Price, \$3.00.

**WATER SUPPLY ENGINEERING.** By Harold E. Babbitt and James J. Doland. New York: McGraw-Hill, 1929. 776 pp. Price, \$6.00.

**THE NEWER KNOWLEDGE OF NUTRITION.** (4th ed.) By E. V. McCollum and Nina Simmonds. New York: Macmillan, 1929. 594 pp. Price, \$5.00.

**LABORATORY METHODS OF THE UNITED STATES ARMY.** (3d ed. rev.) By Charles F. Craig. Philadelphia: Lea & Febiger, 1929. 696 pp. Price, \$3.50.

**A SYSTEM OF BACTERIOLOGY IN RELATION TO MEDICINE.** Vol. IV. Various Authors. His Majesty's Stationery Office, 1929. 482 pp. Price, \$6.00.

**INSECTS, TICKS, MITES AND VENOMOUS ANIMALS OF MEDICAL AND VETERINARY IMPORTANCE.** Part I. Medical. By Walter Scott Patton and Alven M. Evans. Liverpool: Prof. W. S. Patton, 1929. 783 pp. Price, \$5.00.

**HEALTH HEROES.** Edward Livingston Trudeau. By Grace T. Hallock and C. E. Turner. New York: Heath & Co., 1929. 168 pp. Price, \$1.12.

**METHODS OF CHEMICAL ANALYSIS AS APPLIED TO SEWAGE AND SEWAGE EFFLUENTS.** By a Committee appointed by the Minister of Health. London: His Majesty's Stationery Office, 1929. 71 pp. Price, \$.80.

**EINHEITSFURSORGE HARTBERG.** By Dr. Otto Studeny. Berlin: Urban & Schwarzenberg, 1929. 92 pp.

**MILK AND MILK PRODUCTS.** Prepared for the Use of Agricultural College Students. By Clarence Henry Eckles, Willes Barnes Combs and Harold Macy. New York: McGraw-Hill, 1929. 379 pp. Price, \$3.50.

**THE COMMONWEALTH FUND ACTIVITIES IN AUSTRIA.** A Record of Collaboration for Child Health 1923-1929. By William J. French and Geddes Smith. New York: The Commonwealth Fund Division of Publications, 1929. 131 pp. \$3.50.

**LABORATORY MANUAL OF BACTERIOLOGICAL METHODS.** By K. B. Lehmann and R. O. Neumann. Translated by Robert S. Breed. New York: G. E. Stechert, 1929. 103 pp. Price, \$1.50.

**SYNOPSIS OF THE PRACTICE OF PREVENTIVE MEDICINE.** As Applied in the Basic Medical Sciences and Clinical Instruction at the Harvard Medical School. Cambridge: Harvard University Press, 1929. 194 pp.



# A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

**Future Medical Practice and Health**—Indications of the trend of medical practice are examined, and the opinion is offered that more organization is inevitable. The author hopes to see this organization accomplished with the preservation of the essential characteristics of independent practice. A stimulating paper.

ARMSTRONG, D. B. What Direction, Please? *New England J. Med.*, 201, 21: 1039 (Nov. 21), 1929.

**Raw Milk**—The term *contaminated* is suggested as a substitute for *raw*, on the assumption that all raw milk is contaminated milk no matter how carefully produced.

BELL, W. J. Universal Pasteurization Our First Objective. *Pub. Health J. (Canada)*, 20, 11: 531 (Nov.), 1929.

**Propaganda about Cancer Control**—What the public should be told about cancer and how is discussed at length by this British consultant. Not new, but sound.

BURROWS, A. On Telling the Public about Cancer. *Med. Off.*, 42, 18: 195 (Nov. 2), 1929.

**Childhood Tuberculosis Prevention**—Case finding by routine skin tests combined with X-rays when indicated are among the preventive measures discussed. Control measures are suggested but a detailed scheme is not worked out.

CASPARIS, H. Tuberculosis in Children. *J. A. M. A.*, 93, 21: 1639 (Nov. 23), 1929.

**County Sickness Survey**—A morbidity survey in the most sparsely settled county of New York State results in findings comparable, in the main, to those of the preceding rural survey and

provides valuable statistical material.

DEPORTE, J. V. Sickness in Essex County. *New York State J. Med.*, 29, 21: 1311 (Nov. 1), 1929.

**Scarlet Fever**—A brief summary of the control measures against scarlet fever written by the Dicks.

DICK, G. F., and DICK, G. H. The Control of Scarlet Fever. *Am. J. Dis. Child.*, 38, 5: 905 (Nov.), 1929.

**Milk-Borne Scarlet Fever**—A detailed account of the epidemiologic study of a milk-borne scarlet fever outbreak which indicated an udder infection in a cow contracted from a boy who milked the cow while suffering from a "sore throat." From drinking the contaminated milk, 202 cases developed.

EAKINS, W. T. A Milk-Borne Outbreak of Scarlet Fever in which Udder Infection with Scarlatinal Streptococci was Indicated. *Pub. Health News (N. J.)*, 14, 12: 259 (Nov.), 1929.

**Generalized Nursing**—The economy of a generalized nursing service in a rural community is indicated in the study of the problem in Cattaraugus County (N. Y.). A very enlightening paper which should be read by health "authorities" who have violent opinions based upon little experience with this subject.

GAMBLE, L. A., and KING, F. Length of Visits in a Generalized County Nursing Service. *Pub. Health Nurse*, 21, 11: 567 (Nov.), 1929.

**Maternal Mortality**—"It is most important to make proper and adequate provision for the necessary and suitable training of those who are to practice obstetrics in the future." This is the first and greatest consideration.

HOLMES, R. W., et al. Factors and Causes of Maternal Mortality. J. A. M. A., 93, 19: 1440 (Nov. 9), 1929.

**European Infant Mortality**—The League of Nations compilation of infant death rates is presented graphically, and recommendations based on the international study are included.

HOLLAND, D. F. The League of Nations' Investigation of Infant Mortality. Child Health Bull., 5, 6: 167 (Nov.), 1929.

**Mouth Hygiene**—The necessity of teaching the direct relationship between dental disease and health is the burden of this paper. The importance of the first molars is stressed.

HYATT, T. P. Mouth Hygiene Education. Connecticut Health Bull., 43, 11: 395 (Nov.), 1929.

**The Cigarette Evil**—Medical opinions that, under certain conditions, smoking is detrimental to health are marshalled effectively to refute the recent opinion handed down by a disinterested doctor from North Carolina, implying that tobacco's chief harm lies in a slight local irritation to the throat. The author attempts to make a case for the dire effect of nicotine upon fetal life, a conjecture for, or against, which no real scientific evidence has been presented. One of his correspondents makes a good reply.

KNOFF, S. A. Effects of Cigarette Smoking. M. J. & Record, 130, 9: 485 (Nov. 6), 1929.

**Sero-Diagnosis of Syphilis**—A step-by-step examination of the serological tests of value in the diagnosis of syphilis. The Wassermann (Kolmer modification) is more sensitive and less liable to nonspecific reactions than the Kahn or other serum tests. An answer to many of the claims made for the latter tests.

KOLMER, J. A. Truths about the Serum

Diagnosis of Syphilis. J. A. M. A., 93, 19: 1429 (Nov. 9), 1929.

**Nutritive Value of Fat**—In addition to providing an excellent source of body heat, fats regulate the rate of digestion, enable the bulk of diet to be restricted, and supply fat soluble vitamins.

MACLENNON, K., and WILLIAMS, P. N. The Nutritive Value of Fatty Foods. J. State Med., 37, 11: 654 (Nov.), 1929.

**Malnutrition and Tuberculosis**—A British investigation reveals many malnourished children in tuberculous households. The author believes that much can be done to prevent the spread of the disease by clinic care for malnourished contacts.

MORGAN, F. C. Malnutrition in Children in Relation to Tuberculosis. Med. Off., 42, 20: 217 (Nov. 16), 1929.

**British Vaccination Procedure**—The British ministry's recommendations of the "one insertion" vaccination method, the primary vaccination of infants, etc., are reported in this discussion of post-vaccinal encephalitis. This paper will furnish new material for the indefatigable news-hunters of the anti-vaccinist societies who wade through even this inoffensive column in their search for statements to distort. Health workers will find useful information in the paper.

McKINNON, N. E., and DEFRIES, R. D. Recent Recommendations in Vaccination. Pub. Health J. (Canada), 20, 11: 552 (Nov.), 1929.

**Nursing in Social Hygiene**—What one nursing association plans to do (some day) as its share toward the solution of the social hygiene problem. The day may come when all health agencies will ask themselves whether they are doing their part in this neglected field of public health.

PAGAUD, M. V. Nursing Problems in a So-

cial Hygiene Program. *Pub. Health Nurse*, 21, 11: 571 (Nov.), 1929.

**Another "Cold" Germ**—To the long list of bacteria and filtrable viruses causing common colds, an intrepid bacteriologist adds another. This one is an aerobic micrococcus which, grown in pure culture, will produce the disease in subjects from whom the organism is again recovered.

PFEIFFER, J. A. F. An Undescribed Organism Isolated from Acute Rhinitis. *M. J. & Record*, 130, 9: 497 (Nov. 6), 1929.

### More Maternal Mortality Causes

—Lack of prenatal care; failure in aseptic practice; interference with normal labor; unnecessary cesarean sections; undue value on child's life; cross infection; hurried labor. These are the avoidable causes of our high puerperal mortality and morbidity, say these authors.

POLAK, J. O., and CLARK, C. Puerperal Morbidity and Mortality. *J. A. M. A.*, 93, 19: 1436 (Nov. 9), 1929.

### Los Angeles Health Administration

—The story of the unique development of disease prevention and health promotion in Los Angeles County (Calif.). It would be unfair to spoil the health officer's excellent account by attempting to characterize it in this brief space. It will be read.

POMEROY, J. L. Health Center Development in Los Angeles County. *J. A. M. A.*, 93, 20: 1547 (Nov. 17), 1929.

### Diphtheria Immunity and Tonsillectomy

—Of 100 Schick positive children whose tonsils were removed, 82 were Schick negative 6 months after the tonsillectomy was performed. The authors offer several possible explanations

of the phenomena observed, but wisely refrain from drawing conclusions. Many health authorities ought to be in a position to gather evidence to support or contradict the reported observations.

SCHICK, B., and TOPPER, A. Effect of Tonsillectomy and of Adenoidectomy on Diphtheria Immunity. *Am. J. Dis. Child.*, 38, 5: 929 (Nov.), 1929.

### Negro Infant Mortality

—Urban infant death rates are invariably higher than rural. The latter are about the same as for whites in similar areas. The causes of infant deaths are enumerated and compared with white infant mortality.

STOUGHTON, A. L. A Study of Negro Infant Mortality. *Pub. Health Rep.*, 44, 45: 2705 (Nov. 8), 1929.

### Health Administration Abroad

—How the Hamburg (Germany) health work is carried on is recounted in this intensely interesting study. The general sickness rate is low; smallpox is unknown; common communicable diseases are uncommon; general debilitating conditions are rare. Of course, we in super-progressive America have nothing to learn from the backward, old countries. But read it, anyway.

TOWNSEND, J. G. Public Health Organization and Administration in Hamburg, Germany. *Pub. Health Rep.*, 44, 47: 2847 (Nov. 22), 1929.

### Tuberculosis Vaccination

—Chalk up another victory for Calmette's BCG. The author's experience leads him to urge the vaccination of all infants born to parents with open pulmonary tuberculosis.

WEBB, G. B. Immunization against Tuberculosis by *Bacillus Calmette-Guérin* (BCG). *J. A. M. A.*, 93, 19: 1459 (Nov. 9), 1929.

## NEWS FROM THE FIELD

### STANDARD SAFETY CODE

A NATIONAL standard safety code for building exits aimed to cut down the annual loss of 15,000 lives by fire in the United States has just been approved by the American Standards Association and made available for adoption by state and municipal authorities and for use by architects, engineers and builders. The code was prepared by a technical committee of 30 representatives of safety and insurance organizations, federal government departments, state departments of labor, local fire departments, architects, engineers and others. It represents 16 years of study by this committee and its predecessors.

### MAX MASON NEW ROCKEFELLER PRESIDENT

DR. Max Mason assumes the duties of President of the Rockefeller Foundation on January 1, 1930. He succeeds Dr. George E. Vincent, who has been President since May 15, 1917. Dr. Vincent resigned from this position as he has reached the age specified for retirement.

Dr. Mason was formerly connected with the University of Chicago, Massachusetts Institute of Technology, Yale University and the University of Wisconsin. He was president of the University of Chicago from 1925 to 1928.

### MEXICAN BABY STAMPS

THE Republic of Mexico has issued recently many new stamps among which are the "Baby Stamps," whose object it is to contribute to the fund for the reduction of infant mortality. This fund is sponsored by the Association for the Protection of Infants.

The stamp is light blue in color, and has a picture of a woman with a baby in her arms. The caption under the picture is "Help the Infants."

### HEALTH TEST FOR COOKS DECREED BY LAW IN CUBA

STRINGENT new health laws for domestic servants, cooks, nurses and all employees who handle food are to be enforced in Cuba.

The Department of Health is opening a clinic in Havana, where inoculation against typhoid and examination for tuberculosis, diseases of the skin, and blood and intestinal parasites will be carried out.

Inoculation for domestic servants will be compulsory. They will be given a certificate of good health, to be shown when seeking employment.

### CLINIC FOR MENTAL AND NERVOUS DISEASES OF CHILDREN

A FREE municipal clinic for children affected with nervous and mental diseases was opened recently in Turin, Italy. This city also maintains a school for mental defectives, the pupils of which are sent for the summer to a mountain camp or to the seashore.

### WARSAW HAS NEW HOSPITAL

ON November 15, 1929, the Rockefeller Foundation opened a training school for nurses in Warsaw. This will be conducted by the Polish Red Cross.

### NEGRO NURSES

THE Lincoln School for Nurses of Lincoln Hospital, New York, is the largest institution in the country for the training of Negro nurses.

### MEASURES FOR INCREASE OF POPULATION

**A**N Italian law of June 6, 1929, on measures for the increase of population contains the following item:

In the appointment of clerical or manual workers in the Government service, whether national, provincial, or municipal, no preference shall be given to unmarried persons, and, other things being equal, married persons with children shall be preferred to those without children and married persons without children to unmarried persons.

In the assignment of apartments in houses built with Government aid, other things being equal, married persons with children are to be given preference over those without children, and married persons without children over unmarried persons.—*Rassegna della Previdenza Sociale*, Rome, July, 1929, p. 107.

### MENTAL HYGIENE MEETING AT NORWICH, CONN.

**H**AVEN EMERSON, M.D., of Columbia University spoke on November 14, in Norwich, Conn., on "The Place of Mental Hygiene in the Public Health Nursing Program." This meeting was sponsored and arranged by the Mental Hygiene Division of the United Workers of Norwich.

### MEETING OF INTERNATIONAL ASSOCIATION OF DAIRY AND MILK INSPECTORS

**T**HE International Association of Dairy and Milk Inspectors held its eighteenth annual meeting at Memphis, Tenn., October 7-9, 1929. Resolutions were adopted relating to the death of Ivan C. Weld of Washington, D. C., who died a few weeks prior to the meeting, and three brief but eloquent memorial addresses were given. Mr. Weld was largely responsible for organization of the Association and had held the office of secretary-treasurer for 18 years. He was a member of a Com-

mission that went to Germany to advise the government as to methods of improving the dairy industry, and at the time of his death was president of the Washington Chamber of Commerce.

The following officers were elected for the ensuing year: President, Ralph E. Irwin, State Department of Health, Harrisburg, Pa.; First Vice-President, Dr. A. R. B. Richmond, Department of Health, Toronto, Ont.; Second Vice-President, William B. Palmer, Director of the Milk Control District of "the Oranges," Orange, N. J.; Third Vice-President, Dr. Horatio N. Parker, Department of Health, Jacksonville, Fla.; Secretary-Treasurer, Dr. Paul B. Brooks, State Department of Health, Albany, N. Y.

### VIRGINIA PUBLIC HEALTH ASSOCIATION

**T**HE Virginia Public Health Association held a meeting in Charlottesville, Va., on October 21. There were 30 delegates present.

### COUNTY HEALTH DEPARTMENTS FOR MICHIGAN

**W**ITH some aid from the Rockefeller Foundation the Michigan State Department of Health is helping 10 counties to organize their own health departments. A training station at Lansing is being established to provide nurses with the training and field practice in public health work necessary to qualify them for the positions created by these new health units.

The course covers three months' training and can be given to 5 nurses at a time. Other counties are being urged to organize their health work.

### DENMARK'S DELICATE CHILDREN

**M**ORE than 1,000 delicate children were sent during a recent year by the Kingdom of Denmark to the vacation colonies which have been established for such children.

## HOLYOKE, MASS.

MURRAY P. Horwood, Associate Professor of Bacteriology and Public Health at the Massachusetts Institute of Technology, has just completed a *Health Survey of Holyoke, Mass. With Relation to Tuberculosis*. The report includes a comprehensive study of the vital statistics for tuberculosis, the available facilities for diagnosing tuberculosis, the treatment of tuberculosis in hospitals and sanatoriums, the activities of the Holyoke Tuberculosis Association and other voluntary health agencies, and the organization and activities of the Holyoke Department of Health.

## MOTION PICTURES FOR LEPERS

MOTION picture producers cooperating with the Leonard Wood Memorial have recently donated nearly a million feet of film for the use of leper colonies in the Philippines.

## PERSONALS

PROFESSOR OWEN W. RICHARDSON of Kings College, London, was given the Nobel Prize in physics. He is a Fellow of the Royal Society of Sweden.

DR. ANNA E. RUDE, director of the Bureau of Maternal and Child Hygiene of the Los Angeles County Health Department, Calif., has been appointed to President Hoover's White House Conference on Child Health and Protection.

DR. FLORENCE R. SABIN of the Rockefeller Institute for Medical Research received the Pictorial Review medal for the woman who has made the most distinctive contribution to American life in the fields of art, science or letters.

DR. LUCIUS S. NICHOLS is the new Health Officer of Geneva County, Ala.

MRS. MARIE DOUGHTY GORGAS, widow of Major General William C. Gorgas,

died suddenly in Washington on November 8.

DR. ALTON S. POPE has resigned as epidemiologist and chief of the bureau of communicable diseases of the Chicago Health Department, and has accepted a position with the Massachusetts State Health Department.

DR. FRANK J. TRACY is the new chief of the clinic for venereal diseases of the St. Louis City Health Department.

DR. RUSSELL H. KANABLE has been appointed superintendent and medical director of the Wyoming State Tuberculosis Sanatorium, Basin, Wyo.

DR. LYMAN W. CHILDS was recently elected president of the American Association of School Physicians.

C. RUFUS ROREM of the School of Business Administration of the University of Chicago has joined the staff of the Committee on the Cost of Medical Care.

I. S. FALK, formerly Professor of Bacteriology at the University of Chicago, has been appointed Associate Director of Study of the Committee on the Cost of Medical Care.

ROBERT P. FISCHER, formerly Secretary of the New Jersey State Board of Pharmacy, is on the staff of the Committee on the Cost of Medical Care on a part-time basis beginning January 1.

## CONFERENCES

Jan. 17-18, American Social Hygiene Association, New York, N. Y.

Jan. 27-30, 12th Texas Water Works Short School, Abilene, Tex.

Jan. 27-31, Heating and Ventilating Exposition, Philadelphia, Pa.

## FOREIGN

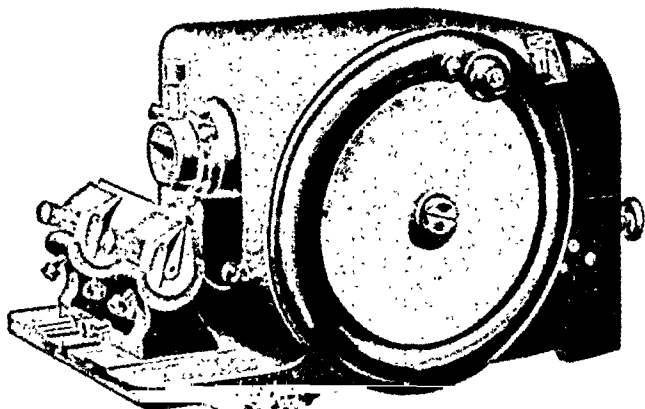
May 19-21, 1930, Second International Malaria Congress, Algiers, Algeria.

July 21-28, Royal Sanitary Institute, 41st Congress and Health Exhibition, Margate, England.

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# American Journal of Public Health

## and THE NATION'S HEALTH Vol. XII No. 2

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Volume XX

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## The Influenza Epidemic of 1928-1929 with Comparative Data for 1918-1919\*

SELWYN D. COLLINS, PH. D.

*Associate Statistician, U. S. Public Health Service, Washington, D. C.*

THE influenza epidemic of the winter of 1928-1929 was by no means the first outbreak since 1918. To get some idea of what has been happening to the influenza-pneumonia death rate during the past decade, weekly data for a group of about 95 cities† have been studied. These cities with an aggregate population of over 30,000,000 are distributed throughout the United States. In order to get a workable population group in such sections as the Mountain States, some cities as small as 12,000 are included. The aggregate population of the 68 cities that had a population of 100,000 or more in 1920 is about the same as the aggregate population of these 95 cities, but the latter group is considerably more representative of the different sections of the country.

In the upper half of Figure I the weekly death rates from influenza and pneumonia combined have been plotted. The dotted line represents the weekly median or expected rate.‡ In the lower half the excess over the median rates have been plotted as an approximation of the extent of the influenza-pneumonia deaths due to the epidemics.

It will be seen that since January 1, 1920, there have occurred six

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\* Summary of a paper presented before the Epidemiology Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 1, 1929.

† Death rates from influenza and from pneumonia for this group of cities have been published weekly in the *Public Health Reports* since January 1, 1925. Published and unpublished reports of deaths in these cities enabled us to carry the record for a large proportion of the cities back to January 1, 1920. Although some of the cities are not included in the earlier years, the group is for the most part identical for the different years.

‡ It may be seen from Figure I that if the epidemic peaks are left out of consideration there is little if any trend either up or down in the actual influenza-pneumonia death rates. The median influenza-pneumonia weekly death rate was, therefore, taken as the "normal," the medians being based on the 7-year period 1921-1927 inclusive. As there was some chance variation in this median rate, the 52 medians, representing the 52 weeks of the calendar year, were smoothed by a 5-period moving average.



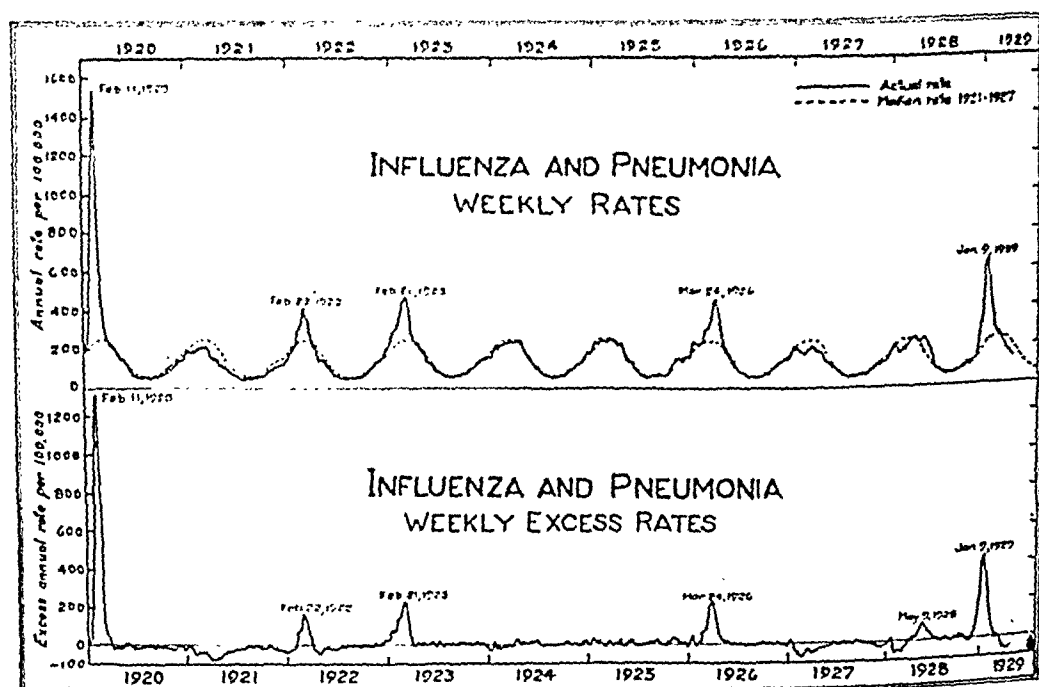


FIGURE I—Weekly total and excess influenza-pneumonia mortality in a group of about 95 cities in the United States, 1920-1929. Dates on graph are middle (Wednesday) of the peak weeks. (Excess over median rates for corresponding weeks for the period 1921-1927. The 52 medians representing "normal" or "expected" rates for the different weeks of the year were smoothed by a 5-period moving average before the excesses were computed.)

more or less definite epidemics. The epidemic of 1928-1929 was the most important since that of 1920. The peaks of these six epidemics occur all the way from the early part of January to the early part of May, and the peak of the pandemic of 1918-1919 occurred much earlier in the fall than was the case in 1928-1929.

The severity of each of the epidemics may be judged to a considerable extent by the weekly excess rates (as given in Figure I), but a more accurate measure would be the total excess rate during the whole period of the epidemic. Table I shows this total excess rate for each of the six epidemics that have occurred since January 1, 1920. Unlike the weekly rates, those in Table I are not on an annual basis.

It will be noted that as measured in total mortality from influenza and pneumonia, the epidemic of 1928-1929 was almost half of that of 1920. If the excess rates as found in these 95 cities are at all representative of the country as a whole, something like 50,000 influenza-pneumonia deaths in the United States occurred during the epidemic of the winter of 1928-1929 in excess of the normal expected number from those causes. The figure for 1920, in agreement with previous estimates, is about 100,000 excess influenza-pneumonia deaths. Dur-

ing the 1918-1919 pandemic, it has been estimated that about 500,000 influenza-pneumonia deaths occurred in this country in excess of the normal expected number, so that the recent epidemic of 1928-1929 caused only about one-tenth as many deaths as the great pandemic. It will be recalled that during the winter of 1918-1919 the influenza-pneumonia death rate remained high for a long period after the peak of the epidemic; in fact, during a period of eight or nine months the death rate was very much above normal.

Table I also shows for each of the geographical sections the total excess rates \* during each of the epidemics since 1920. In the 1928-

TABLE I

TOTAL EXCESS \* INFLUENZA-PNEUMONIA DEATH RATE PER 100,000 DURING THE WHOLE OF EACH EPIDEMIC IN CITIES OF THE DIFFERENT GEOGRAPHIC SECTIONS OF THE UNITED STATES, 1920-1929

Geographic section	Epidemic of:					
	1920	1922	1923	1926	Spring of 1928	Winter of 1928-1929
All cities.....	99.3	18.3	29.9	25.3	11.6	44.4
New England.....	96.6	29.5	36.6	30.0	15.4	42.3
Middle Atlantic.....	95.2	24.7	26.5	41.2	20.9	43.0
South Atlantic.....	94.2	9.4	42.7	26.2	none	47.6
East North Central.....	109.4	11.4	32.2	22.2	17.9	43.7
East South Central.....	99.1	16.0	44.0	38.2	11.9	92.0
West North Central.....	121.9	34.8	53.3	none	4.9	42.8
West South Central.....	91.2	14.6	6.7	58.8	13.7	68.2
Mountain.....	159.5	36.2	17.6	16.8	7.7	68.7
Pacific.....	57.7	36.3	11.3	9.3	none	43.0

\* Excess over the median rates for corresponding weeks for the period 1921-1927. The series of 52 medians representing "normal" or "expected" rates for the different weeks of the year were smoothed by a 5-period moving average before the excesses were computed. It should be noted that the rates in this table, unlike the rates shown in Figure I, are not on an annual basis.

Because the rates in non-epidemic weeks of 1922 are nearly all lower than the median rate 1921-1927, a correction was made for that epidemic by measuring the excess not over the zero base line representing the median rate (Figure I) but over a line parallel to the base line but 25 points (in the rate per 100,000) below it. The amount of this correction varied in the different geographic areas.

1929 epidemic the excess rates in six of the nine sections were practically the same, varying only from 42 to 48 per 100,000. In three sections, the East South Central, West South Central and Mountain, the rates were considerably higher than in the other six sections, the East South Central cities having a particularly high rate.

It will be recalled that, so far as the country as a whole was concerned, the 1922 epidemic was rather small, the epidemics of 1923 and

\* Median or expected rates and excesses above those rates were computed for each section in the manner already outlined in connection with the cities considered as a whole.

1926 both being somewhat larger. It will be noted that on the Pacific Coast the 1922 epidemic was rather large, the total excess rate being about four-fifths of the corresponding rate in the 1928-1929 epidemic. The epidemics of 1923 and 1926 were very small in the Pacific coast cities. In the East South Central section the total excess death rate in the 1928-1929 epidemic was nearly as large as that of the 1920 epidemic.

Each of the six epidemics that have been noted as occurring since January 1, 1920, appeared to some extent in nearly all of the nine sections. However, a few sections showed a considerable excess during years that, so far as the country as a whole was concerned, were considered relatively free from influenza. For example, in 1925 the West South Central section showed excess death rates as great as occurred in many sections during the years 1922, 1923 and 1926.

### WINTER OF 1928 AND 1929

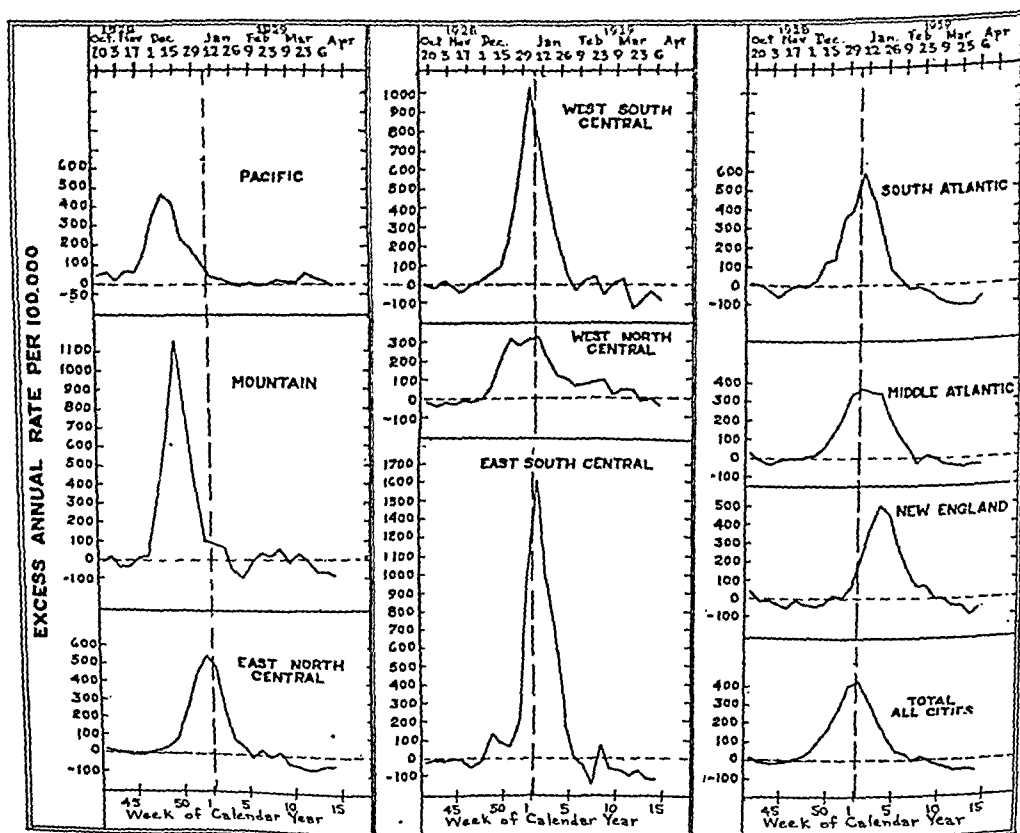


FIGURE II—Weekly excess influenza-pneumonia mortality in a group of cities in each geographic section of the United States during the epidemic of the winter of 1928-1929. Sections arranged in order of dates of peak mortality as shown in Figure III. (Excess over median rates in the same geographic section for corresponding weeks for the period 1921-1927.)

In Figure II the weekly excess rates for each geographic section are plotted for the short period in the winter of 1928–1929, during which influenza was epidemic. The broken vertical line represents the peak date of the epidemic when the total 95 cities are considered as a group, the excess rates for the whole group being plotted in the lower right hand section of the figure. The peak of the excess mortality occurred on the Pacific Coast early in December. The different sections following the Pacific Coast are arranged in the order of the occurrence of the peaks. Reading the sections down the graph it may be seen that the epidemic followed a very regular course from west to east, ending in New England with a peak about seven weeks later than that on the Pacific Coast.

In contrast to the 1928–1929 epidemic, the 1920 epidemic spread over the country in a very much shorter time. This epidemic apparently started in the East North Central States, around Chicago, from which it traveled east, west and south, ending in the East South Central States with a peak date only about two or three weeks after that in the first section. Figure III shows on a map the starting place and spread of the epidemics of 1920 and of 1928–1929.

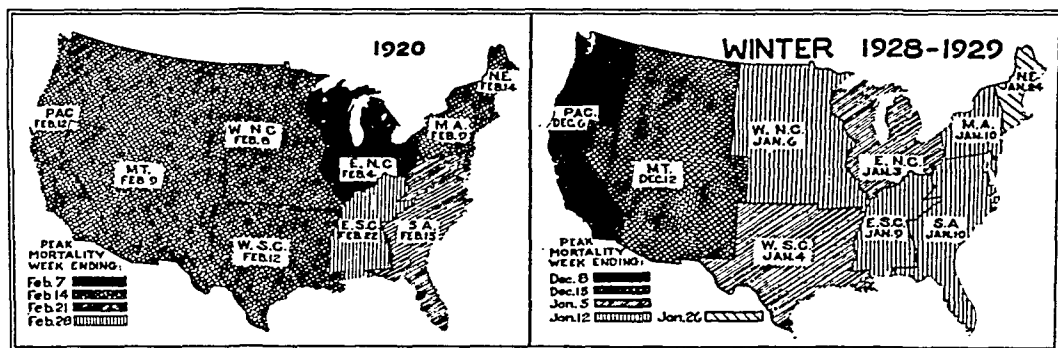


FIGURE III—Time of occurrence of two influenza epidemics in cities of different geographic sections of the United States. Darkest sections were first, and lightest sections were last to be affected. (Dates represent estimated peak days for the section, the estimate being made by interpolation within the peak week when account is taken of the rates for the two adjacent weeks.)

The 1926 epidemic, like the recent one of 1928–1929, apparently started on the Pacific Coast. The 1923 epidemic started in the East South Central section and spread rather slowly to other sections of the country. The spread of the epidemics of 1922 and of the spring of 1928 was rather indefinite but the former appears to have started in the East, probably in the Middle Atlantic section, and the latter in the West, probably in the Mountain section. There is, then, no one section where epidemics usually start; in the six epidemics the start has occurred in five different sections.

INFLUENZA MORBIDITY\* AS INDICATED BY SPECIAL SURVEYS,  
1928-1929 AND 1918-1919

Immediately after the 1928-1929 epidemic the U. S. Public Health Service made surveys in 10 cities in the United States similar to surveys made in about an equal number of cities in 1918-1919. In cooperation with state health departments, some small towns and rural communities were surveyed in Missouri, New York, and Massachusetts. The selected localities of the two epidemics were not identical, but the incidence rates probably give a fairly accurate idea of the number of cases in the two epidemics.

House to house canvasses were made of selected districts with a total population of 10,000 to 15,000 persons in each of the cities to be surveyed.† The two surveys were made along generally comparable lines, but there were some differences in the methods used. In the 1918-1919 survey, the enumerators were instructed to class as influenza such reported "colds" as lasted three days and kept the patient in bed one whole day, unless the case had been otherwise diagnosed by a physician. Other colds were to be recorded as "doubtful," but the number of such doubtful cases reported was so small that it appears that only the more severe colds were remembered by the informants. Attention in 1918 must have been fixed on such cases as were reported as influenza, because of the unusual importance of the disease during the great pandemic. Moreover, the term "doubtful" would suggest to the enumerator, in spite of the instructions to the contrary, that only such colds should be included as might have been influenza.

In the 1928-1929 survey, the enumerators were instructed to inquire about and to record "colds" as such, in addition to influenza, grippe and pneumonia. While the record of "colds" must be incomplete because minor cases were forgotten, it seems reasonable to believe that it contains a larger proportion of the colds that actually occurred than was true of the "doubtful" category of the 1918-1919 surveys. We have accordingly classified the colds reported in the 1928-1929 survey into those causing one or more days in bed and those in which the patient was not confined to bed. For purposes of comparison with the 1918 surveys these colds in bed have generally been included with influenza, pneumonia and grippe as more nearly approximating the influenza, pneumonia and doubtful category of the 1918 data.

Of the cases definitely classified as influenza or grippe, the 1928-

\* The data in this section are preliminary and subject to minor changes in later reports.

† For a more detailed statement of the methods, see Veldee, M. V., Morbidity in the Influenza Epidemic of 1928-1929—Preliminary Report on Surveys in Various Cities, *Pub. Health Rep.*, 44, 19 (May 10), 1929. (Reprint 1282.)

1929 rate of 145 per 1,000 persons canvassed is somewhat more than one-half of the rate of 242 per 1,000 in the 1918-1919 epidemic. In the 1918-1919 epidemic the incidence of pneumonia was 16.4 per 1,000, or more than three times the rate of 4.7 cases per 1,000 in 1928-1929. The incidence rate for the group of cases classified as "doubtful," 21.5 per 1,000, in the 1918-1919 surveys was only about half the rate of 39.6 per 1,000 for colds with one or more days in bed in the 1928-1929 epidemic. In addition, there was reported in 1928-1929 a large number of colds (76.6 per 1,000) that involved no days in bed. Considering all the respiratory conditions together, the rate in 1928-1929 was not far different from what it was in 1918-1919, but, as already noted, the 1928-1929 data appear to include a considerably larger proportion of the cases of common colds, such as occur during every winter, than is true of the 1918-1919 data.

Table II shows the case rate for each of the localities surveyed in 1928-1929 and in 1918-1919. Although the localities were not the same in the two surveys (only three surveyed in 1918-1919 were surveyed in 1928-1929), the general picture is perhaps comparable. In this table colds involving one or more days in bed have been included with influenza, grippe and pneumonia because, as already stated, that combination appears to be more nearly comparable to the 1918 data which include influenza, grippe, pneumonia and "doubtful." Another disturbing element is the fact that the period for which respiratory

TABLE II

INCIDENCE OF INFLUENZA AND GRIPPE\* IN EACH OF A GROUP OF LOCALITIES SURVEYED IN 1928-1929  
AND IN EACH OF A GROUP OF LOCALITIES SURVEYED IN 1918-1919

1928-1929	Case rate per 1,000 persons canvassed	1918-1919	Case rate per 1,000 persons canvassed
All localities.....	189	All localities.....	280
Des Moines, Ia.....	304	San Antonio, Tex.....	535
Minor Towns.....	252	Minor Md. Towns.....	405
Seattle, Wash.....	222	Little Rock, Ark.....	359
Kansas City, Mo.....	188	Augusta, Ga.....	341
Pittsburgh, Pa.....	181	Baltimore, Md.....	246
New Orleans, La.....	181	Des Moines, Ia.....	231
Syracuse, N. Y.....	177	San Francisco, Calif.....	215
San Francisco, Calif.....	161	Spartanburg, S. C.....	214
Cincinnati, O.....	159	Macon, Ga.....	213
Boston, Mass.....	154	New London, Conn.....	185
Baltimore, Md.....	138	Louisville, Ky.....	150

\* 1928-1929 cases include influenza, grippe, pneumonia and colds with one or more days in bed; 1918-1919 cases include influenza, grippe, pneumonia and "doubtful."

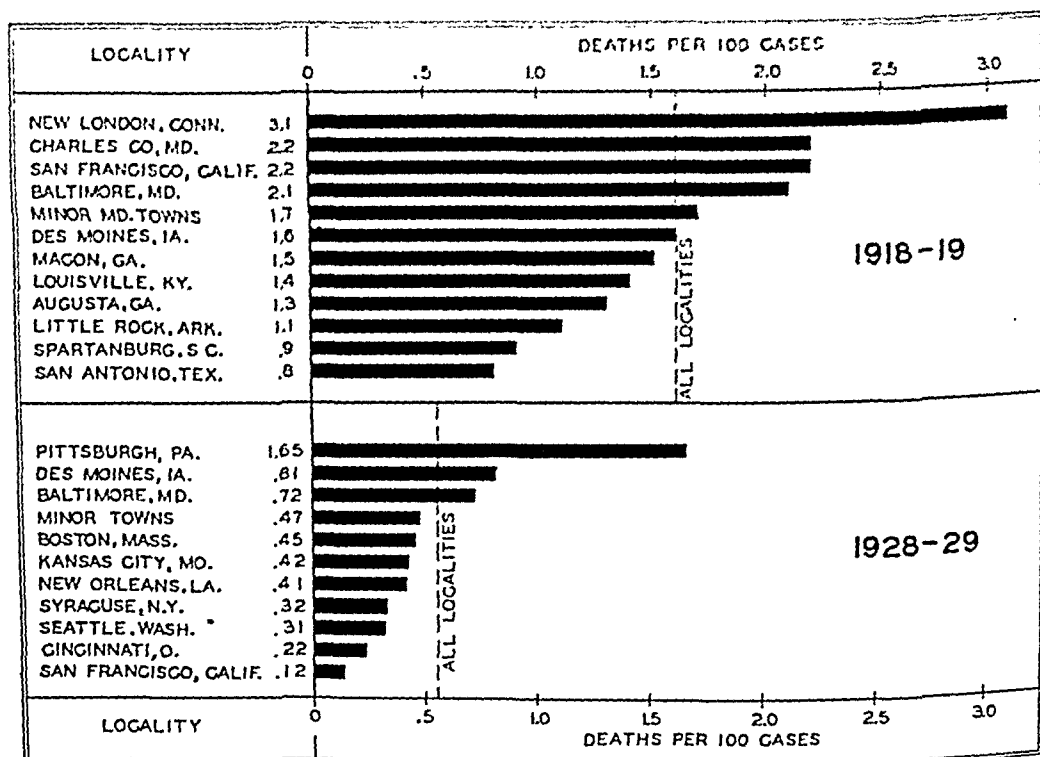


FIGURE IV—Case fatality of influenza and grippé in each of a group of localities surveyed in 1928-1929 and in each of a group of localities surveyed in 1918-1919. (Cases in 1928-1929 include influenza, grippé, pneumonia and colds with one or more days in bed; 1918-1919 cases include influenza, grippé, pneumonia and "doubtful.")

attacks were recorded varied in the different localities. In spite of these possibilities of error, it is believed that the data in Table II give a fair picture of the extent and variation of the influenza morbidity rates in a few fairly representative localities in the two epidemics.

The case fatality is hard to determine because it is difficult to estimate how many cases of influenza occurred. Considering all surveyed localities together, the case fatality in the 1928-1929 epidemic was 0.70 per cent if the deaths are related to only the cases definitely reported as influenza, grippé or pneumonia. If the colds that involved one or more days in bed be added to these cases as possible influenza, then the fatality becomes 0.56 per cent. If all colds as well as influenza and grippé be considered as a unit, the fatality is 0.40 per cent. Considering these three statements, it may be said that the case fatality in 1928-1929 was somewhere between one-fourth and one-half of that shown by the surveys of 1918-1919 (1.6 per cent).

Figure IV shows the case fatality for each of the surveyed localities in 1928-1929 and for each of those surveyed in 1918-1919. It may be seen that only one locality, Pittsburgh, reached as high a fatality in 1928-1929 as the average for all surveyed localities in 1918-1919.

As regards the proportion of cases complicated by pneumonia, the percentage also varies according to what type of respiratory attacks are considered as influenza or at least doubtful influenza. In the 1918-1919 epidemic about 6 per cent of the cases were complicated by pneumonia, against from 2 to 3 per cent in that of 1928-1929.

In the 1918-1919 epidemic, the deaths constituted 25 per cent of the cases of pneumonia and in 1928-1929, 21 per cent. It appears, therefore, that the great difference in the fatality of influenza and grippe is due to the difference in the percentage of cases complicated by pneumonia.

TABLE III

PERCENTAGE OF INFLUENZA AND GRIPPE \* CASES THAT WERE COMPLICATED BY PNEUMONIA IN EACH OF A GROUP OF LOCALITIES SURVEYED IN 1928-1929 AND IN EACH OF A GROUP OF LOCALITIES SURVEYED IN 1918-1919

1928-1929	Per cent of cases complicated by pneumonia	1918-1919	Per cent of cases complicated by pneumonia
All localities.....	2.6	All localities.....	6.3
Pittsburgh, Pa.....	4.5	Des Moines, Ia.....	10.2
Boston, Mass.....	3.5	New London, Conn.....	9.3
Baltimore, Md.....	3.5	San Francisco, Calif.....	8.0
Kansas City, Mo.....	3.3	Baltimore, Md.....	7.3
Syracuse, N. Y.....	2.4	Minor Md. Towns.....	6.4
Minor Towns.....	2.4	Louisville, Ky.....	6.2
Cincinnati, O.....	2.4	Macon, Ga.....	6.1
Des Moines, Ia.....	2.2	Augusta, Ga.....	4.5
New Orleans, La.....	2.0	San Antonio, Tex.....	4.5
Seattle, Wash.....	1.6	Little Rock, Ark.....	4.5
San Francisco, Calif.....	1.5	Spartanburg, S. C. ....	3.1

\* 1928-1929 cases include influenza, grippe, pneumonia and colds with one or more days in bed; 1918-1919 cases include influenza, grippe, pneumonia and "doubtful."

Table III shows the percentage of cases that were complicated by pneumonia. In 1918-1919 nearly 10 per cent of the cases reported in Des Moines were complicated by pneumonia and the average for all of the surveyed localities was nearly 6 per cent. In 1928-1929 the highest percentage of cases complicated by pneumonia was 4.5 for Pittsburgh—a figure considerably below the average of the surveyed localities in 1918-1919.

Figure V shows the age incidence of influenza and grippe in all localities surveyed in 1918-1919 and in 1928-1929. The very high incidence under 30 years of age and the rather rapid decline in the incidence as age increased, which were characteristic of the 1918-1919 epidemic, are not found in the 1928-1929 data. There is, however, one point of similarity—a rather high incidence under 10 years



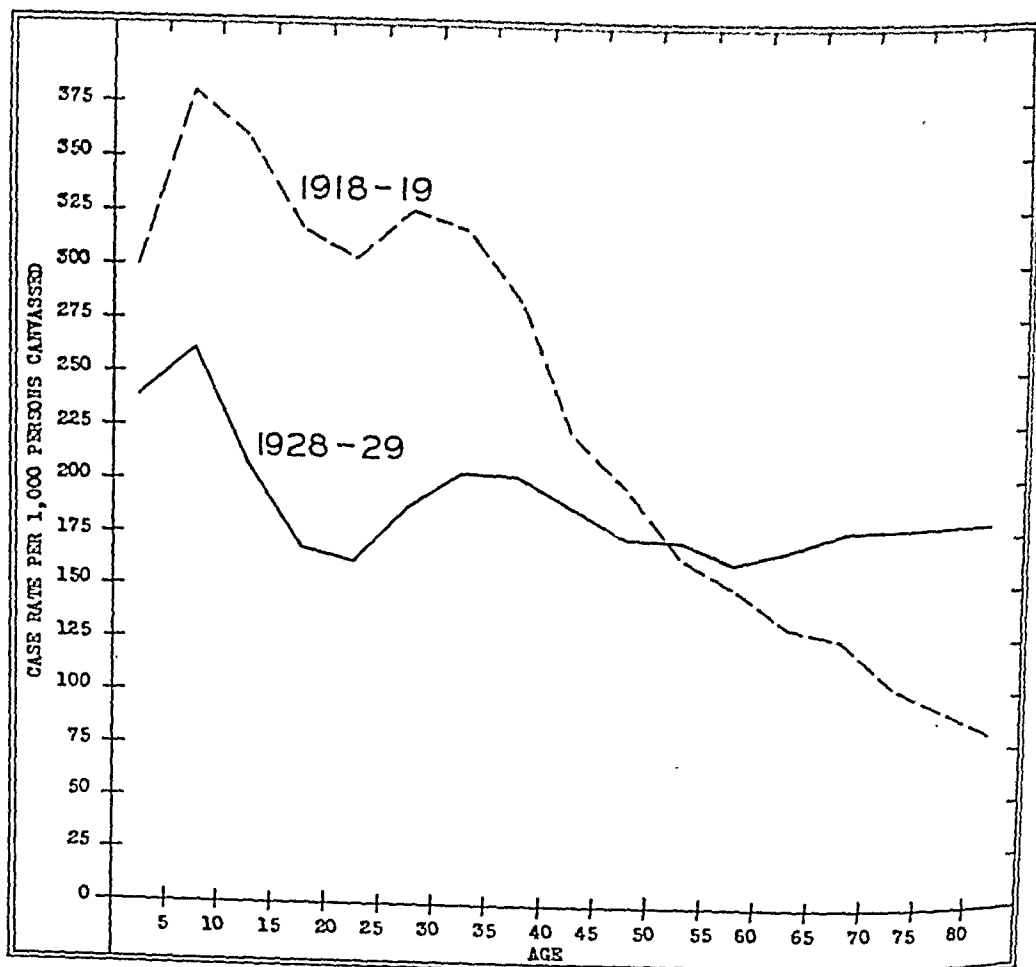


FIGURE V—Age incidence of influenza and gripe in a group of localities surveyed in 1928-1929 and in a group of localities surveyed in 1918-1919. (Cases in 1928-1929 include influenza, gripe, pneumonia and colds with one or more days in bed; 1918-1919 cases include influenza, gripe, pneumonia and "doubtful.")

of age followed by a considerable drop to a minimum from 15 to 25 years with a rise and a second peak around 30 to 40 years of age. This type of curve seems to run quite consistently through all the localities in 1928-1929. Although not reproduced here, that in general was the description of the age curve of influenza that occurred in Baltimore, Md., during the epidemic of 1920 and in Hagerstown, Md., during the epidemics of 1922 and 1923.<sup>1</sup> It might be stated that the age curves of influenza and of gripe in the 1928-1929 data are very similar, both showing peaks at 5 to 9 and again at 30 to 40 years of age. The age curves for all colds and for colds with one or more days in bed, however, are quite different from the curve for influenza and gripe.

#### SUMMARY

Influenza-pneumonia mortality data for 95 cities representing all sections of the United States indicate that since January 1, 1920, six

definite epidemics have occurred. If the excess rates in these cities are at all representative of the country as a whole, about 50,000 influenza-pneumonia deaths occurred in the United States during the epidemic of the winter of 1928-1929 in excess of the normal number from those cases. During the six epidemics between 1920 and 1929, something like 250,000 excess influenza-pneumonia deaths occurred in this country—equal to about half of the 500,000 excess influenza-pneumonia deaths in the United States during the pandemic of 1918-1919.

The case incidence of influenza and grippe in the 1928-1929 epidemic as determined by the special surveys, seemed to be more than half of that of 1918-1919. The percentage of cases complicated by pneumonia and the case fatality, however, were much less in the recent epidemic, being in 1928-1929 somewhere between one-fourth and one-half of the corresponding figures for 1918-1919.

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1. Sydenstricker, Edgar. The Incidence of Various Diseases According to Age, Hagerstown Morbidity Studies No. VIII, Reprint 1227, *Pub. Health Rep.*, 43, 19 (May 11), 1928.

EXPLANATION: In this paper the terms "influenza" and "influenza-pneumonia" designate the classifications in the recorded mortality that were used and are not intended to suggest that the various respiratory epidemics were necessarily etiologically the same.

NOTE: In the preparation of this paper I have had the advice and assistance of W. H. Frost, M.D., Consultant, and Statistician Edgar Sydenstricker, who, with the author, constitute a board for the study of respiratory diseases appointed by the Surgeon General of the U. S. Public Health Service. Some of the charts here presented will be included in a more detailed article including tabular material which will be published by the Service.

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## "Bargain" Eyeglasses Ruin the Eyes

THE National Society for the Prevention of Blindness and the National Better Business Bureau have recently called attention to the fact that certain mail order houses are selling spectacles by mail and that thousands of persons are endangering their eyesight by the use of such glasses which strain instead of aid the vision.

This warning is fully justified, but the organizations in question might well have called attention at the same time to the equally bad practice by department and five and ten cent stores of selling eyeglasses which are fitted (?) by inexperienced salespersons. This practice is a violation of the Education Law in New York State, the legality of which was recently upheld by the Supreme Court of the United States.—*Health News*, Nov. 25, 1929.

# What We Know of Influenza and How We May Add to Our Knowledge\*

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ON previous occasions I have taken so much time and space in setting forth the scanty nature of our knowledge of influenza that any further detailed discussion of our ignorance seems unnecessary. A few topics, however, appear worthy of brief consideration.

1. The rapidity with which epidemic influenza travels and the large number of persons attacked within a short period gave rise to early conjecture that the disease was borne by the wind or, at least, that it was dependent on general atmospheric or even cosmic conditions which affected nearly simultaneously large masses of people. One writer asserted that "the depraved Constitutions of the Atmosphere are the Causes of almost all epidemic Distempers" (Huxham). Another called influenza "a blast from the stars." These beliefs have died hard and there are still today some observers who maintain that the occurrence of widespread and mysterious fluctuations in susceptibility furnish an adequate explanation for the rise of pandemics. Modern students of influenza are, however, a unit in regarding influenza as a typical infectious disease due to a living, if yet unknown, microorganism. Whatever the origin of pandemics, whatever the possible predisposing effect of obscure cosmic factors, there need be no hesitation in accepting the fact that influenza is a germ disease spread largely, if not wholly, by human agency.

2. The mode of transmission of influenza is necessarily inferential. There is no evidence that water or milk ever serves as a vehicle of infection or that the virus resists drying for considerable periods and is transmitted in dust. The various diseases of domestic animals denominated influenza seem to have no relation to the human infection. The hypothesis of an insect vector appears quite fantastic. The facts that are known about the manner of spread of influenza epidemics accord best with the hypothesis that the disease passes directly from one human being to another, probably by drop-

\* Read before the Epidemiology Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 1, 1929.

let infection. While no precise information exists as to the relative importance of active cases, convalescent cases, or healthy carriers, in spreading infection, there is reason to believe that persons suffering from the disease in its early stages are particularly likely to convey the infection to others.

3. Since the pandemic of 1918-1919 the laboratory study of the infection seems to have languished, and few bacteriological studies of importance have appeared. This would seem to be due not to any lack of material—for several extensive epidemics have occurred—but to the almost overwhelming technical difficulties involved. The remarkable quality that the influenza virus has of facilitating invasion of the body by many kinds of other microbes, the apparent insusceptibility of the ordinary domestic and laboratory animals to influenza infection, and the difficulties of securing non-immune human volunteers and inoculating them with a freshly isolated virus during an epidemic period, are some of the factors that make the bacteriological investigation of influenza peculiarly arduous and complicated. The most recent extensive study of which I am aware is that carried out by Falk and his associates in the University of Chicago. Their results, obtained by monkey inoculations on a large scale, are in a high degree suggestive of the isolation of a definite microbe. Their conclusions must necessarily run the gauntlet of confirmation by other workers.

4. Much of the early uncertainty about the identity of inter-pandemic influenza has now disappeared. The careful clinical and epidemiological studies made since 1919 have left little doubt in the minds of most observers that such outbreaks as those of 1920, 1926 and 1928-1929 in this country, and those of 1922, 1927 and 1928-1929 in Great Britain, are definitely comparable with the great pandemics. While we must wait on substantial bacteriological knowledge for a final conclusion, we seem at the moment amply justified in the assumption that at least under modern conditions of transportation there is no break in the continuity of influenza infection in large population aggregates.

Since 1919 there have been many local flare-ups in Europe and North America, and a considerable number of fairly widespread outbreaks in addition to the notable epidemics already specified. This may be taken as support for the view that the virus of influenza is widely disseminated throughout the civilized world; that from time to time special varieties of this virus arise by unknown biological processes; and that some of these varieties become the prime factor in the genesis of epidemics of greater or less magnitude. It may

even be true that these new types of influenza virus are merely immunologic races similar to those known to occur in several familiar microbic groups, and that the advent of one of these new races in a population already fairly immunized to its own indigenous strains finds such a mass of specifically susceptible individuals that rapid epidemic spread is possible. Whether this is the explanation or not, it seems to be the case that at least in recent years influenza has not died out completely on the great continents in the periods between the pandemics. The relatively incomplete data available for 1890 to 1918 appeared to indicate this quite strongly; the observations made since 1918 bear witness that for every calendar year since the greatest of pandemics it is possible to obtain a record of the excessive prevalence of influenza somewhere in the world.

5. In the field of prevention little real progress has been made. It seems justifiable to increase the emphasis already placed on the influenza patient as a definite focus of infection and to adopt reasonable measures to reduce crowding and direct contact to a minimum during a period of epidemic prevalence. A stricter isolation of influenza patients will probably some day be put into effect. During the 1928 epidemic at the University of Oregon,<sup>1</sup> stress was laid upon the early isolation of all sick persons, with the result that the morbidity was less than 15 per cent, whereas 9 of the 15 nurses employed (60 per cent) contracted influenza. The opportunities for self protection by individuals lie along the same line: avoidance of crowds and of direct contact with influenza patients and with all persons suffering from "colds"; rigorous abstention from the use of common drinking glasses, common towels and the like; and scrupulous hand washing before eating. While measures of personal hygiene designed to promote physical vigor and well-being are assuredly not to be decried, it is not clear that such measures are efficacious in preventing influenza infection during an epidemic period.

In the lack of any demonstrated causal agent of influenza it is plain that no valid specific vaccine is available. The so-called influenza vaccines and serums prepared with a gay assortment of organisms of conjectural importance could hardly be expected to be very effective. In point of fact their use, whenever accompanied by adequate controls, has signally failed to show any beneficial result. In a recent report by Sir George Newman, Chief Medical Officer of the British Ministry of Health, the records of influenza incidence among the inoculated and uninoculated pupils at a large public school from 1920 to 1929 manifest in a striking way the absence of any cogent evidence of protection. Since the immunity conferred by a natural

attack of influenza is apparently slight and transient, we are perhaps not warranted in entertaining very high hopes of success from artificial immunization.

Among the almost innumerable problems concerning influenza that present themselves to the investigator, only a few of the more crucial can be mentioned here.

1. Interest has always been keen in the relation of influenza to the common cold. Observers have reported that during an influenza epidemic many "colds" are of the "influenzal" type, and in some instances definitely traceable to cases of "true" influenza. In a non-influenzal period even, many observers have been struck by the similarity to influenza both of individual cases of "cold" and of small epidemics. There is obviously chance for confusion here, but if it is true, as it seems to be, that influenza never quite disappears from our great communities, it may be fairly supposed that certain more or less definite clinical and epidemiological types deserve to be included in the influenza concept.

One of the most important questions to be settled is: When is a cold a cold, and when is it influenza? The recent studies of van Loghem<sup>2</sup> in Holland are thought by him to indicate an epidemiological differentiation between the illnesses in that country reported by volunteer lay observers as colds and those reported as influenza. Whereas the increase and decrease of colds in the Netherlands from September, 1925, to June, 1926, ran parallel to the fall and rise of air temperature and, in his opinion, gave no evidence of contagiousness, the reported cases of influenza followed a generally independent course and attained their maximum in March-April. Both pneumonia mortality and influenza mortality concurred with the influenza cases of the inquiry. This is interpreted by van Loghem as indicating a rather sharp demarcation between colds—which he classes as non-contagious commensal infections founded on a disturbance of thermo-regulation—and influenza—which he regards as a true parasitic infection, taking its own epidemic course. van Loghem's data, however evaluated, should be greatly extended to elicit the true relation between colds, influenza and pneumonia. There is obviously much to be hoped here from significant epidemiological studies such as those being carried out by Frost during interpandemic periods.

2. Attempts to identify influenza or to distinguish between influenza and colds bring up sooner or later against the time honored problem of the clinical differentiation of influenza. That this is a hard nut to crack cannot be doubted. Apparently most cases of influenza, particularly those in patients ill enough to be available for

inquiry, are complicated by secondary or concurrent infections with a variety of microorganisms, and the simple influenza symptom complex—if there be such—is consequently usually distorted or at any rate variously colored.

In other diseases clinical phenomena often fail to give clear-cut distinctions corresponding to the specificity of the attacking microbe. Even in well known and long studied diseases, such as typhoid and the paratyphoid infections, clinical differentiation may completely fail. When all is said, however, I am unwilling to believe that the possibilities of clinical study of influenza and colds have been exhausted. Several good observers consider the blood-picture of influenza with its frequent leukopenia, its absence or nearly complete absence of eosinophils and blood platelets and its relative lymphocytosis to be highly characteristic. In the latest epidemic the hematologic picture where observed was said to be strikingly uniform. Intensive clinical and laboratory study of selected cases should be of great value.

3. The significance of local variations in the prevalence and mortality of influenza offers a problem of engrossing interest. Why is it that in definite geographic areas in every great epidemic the discrepancy between the lowest and highest incidence and the lowest and highest excess mortality rates should be so great as is the case? It is stated that in last winter's outbreak in the United States, influenza first appeared in October at San Francisco, where an increase in the death rate was manifest toward the end of the month. In that city, however, the increase in deaths from influenza and pneumonia never reached a high point and the cumulative excess annual mortality rate was only 762 in 11 weeks, while in Los Angeles it aggregated 5,136 in 12 weeks. This was reversing the conditions observed in 1920, when San Francisco had a much greater excess death rate than Los Angeles. It might be tempting to cast about for an explanation of such phenomena on the basis of population immunization, were there not a considerable number of instances in which a high or a low influenza-pneumonia mortality recurs steadily in one and the same locality, epidemic after epidemic. Pittsburgh affords one of the most remarkable instances of this sort, having had the highest—or nearly the highest—rate in any American city in 1918, repeating this record again in 1920 and ranking second only to Birmingham, Ala., in 1929.\* The city of Sheffield, England, seems to be similarly liable to frequent and severe visitations of influenza. Of the latest epidemic (1929) the report of the British Ministry of

\* It is, of course, impossible to say what proportion of the excess mortality is due to a high influenza incidence rate and what proportion to a high case-fatality.

Health says: ". . . as in previous inter-pandemic outbreaks, this city [Sheffield] appeared to be a local focus of infection."

A singular feature of local distribution is the patchy character of most of the large outbreaks; cities close to one another often show a marked difference in death rates. In 1928-1929 Cincinnati and Columbus, O., had considerably higher rates than Cleveland and Toledo in the northern part of the state. Dayton, however, less than 60 miles from Cincinnati, had the lowest rate of any of the five cities. In this same epidemic, also, the cumulative excess death rate (9 weeks) was more than 25 per cent greater in St. Paul than in Minneapolis. In April, 1926, the city of Glasgow, Scotland, suffered severely from an influenza outbreak, while Edinburgh, less than 50 miles from Glasgow, was hardly affected by the epidemic and showed no rise in general death rate. It was noted in Massachusetts in the 1918 epidemic that "the incidence of the infection varied widely and for no apparent reason. . . . Marlborough, surrounded by cities and towns almost overwhelmed by the outbreak, had few cases and needed no help."

Here must be mentioned, too, the change in the general character of an epidemic as it passes from one region to another. The 1928-1929 epidemic in the United States, which first appeared on the Pacific coast and travelled generally eastward, seems to have lost its epidemic push as it neared the Atlantic seaboard. The death rates in New York, Boston, Philadelphia and Baltimore were relatively little affected by the advent of the epidemic. In Germany, on the other hand, the epidemic which first appeared at Breslau about the middle of December, 1928, became much more serious as it travelled westward, the death rates in many towns in western Germany which were attacked a month later rising to twice the height of those of the towns in Brandenburg and Saxony." Light should be thrown on some of the problems of this nature by the epidemiological studies now in progress of Rosenau and his associates in Massachusetts and of Smillie and others in isolated communities in several well selected parts of the world.

4. One of the most striking features of interpandemic influenza is its seasonal mortality. While it is true that several of the large pandemics have originated in summer, late spring, or early autumn, the majority and especially the minor epidemics of the interpandemic periods have shown—as judged by mortality—a marked predilection for the colder months of the year. In the large cities of the United States the weekly excess mortality rate (annual basis) reached its peak in 1920 in the week ended February 14, in 1926 in the week



ended March 27, and in 1929 in the week ended January 12. In England also, during the outbreaks of 1922, 1924, 1927 and 1929 the peak of influenza deaths in the large cities fell in the first three months of the year.

Continuous morbidity studies accompanied by climatic data should help to determine to what extent the seasonal exacerbation of the influenza death rate is due to an increased prevalence of the infection and to what extent to a relatively high case-fatality. Here also detailed and sufficiently prolonged studies in isolated communities as well as in centers of population are needed for the determination of the fundamental relation between predisposition and infection. There is little doubt that our knowledge of influenza can be greatly extended by systematic epidemiological inquiry along these lines.

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3. *Month. Epidemiol. Rep.*, League of Nations, Mar. 15, 1929.

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## Traveling Child Health Centers in Italy

CHILD health centers have been functioning for years in the larger cities of Italy, but they were practically unknown in the rural districts until 1927 when they were organized in these districts by the government. For this purpose it was planned to divide the country into a number of districts each to be under the supervision of a physician and each to be equipped with several traveling child health centers. The number of centers is gradually increasing. So far they have been established for the most part on the islands and in southern Italy. Only one center has been functioning in the North. Each of the centers now functioning serves about 20 rural settlements, 2 to 3 of which are visited in a day. In this way every settlement is visited once each week.

The staff of a traveling center consists of an especially trained physician and one or more assistants. The physician examines mothers and children, tells them the important rules of hygiene and dietetics, and distributes milk and other food for the children. The assistant visits the home and teaches the mother how to dress, bathe, and give general care to the children. Some of the centers have on the staff a specialist in obstetrics and gynecology, who examines the mothers and gives them the necessary advice. A record is kept of every woman and child examined so that it is possible to follow up the cases.

# Typhoid Fever Epidemic Occurring During the Summer of 1928\*

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DURING the past 26 years San Francisco has experienced 3 outbreaks of typhoid fever traceable to milk. The first occurred prior to the earthquake and fire of 1906, and the second during the summer of 1908. In both instances the cause was an acute case of typhoid fever at the producing dairy and came to the attention of the Department of Health through the reporting by the physician of the case after it had been hospitalized. It was not until 10 days later that cases of typhoid were reported in different sections of the city served by these two raw milk dairies. Subsequent to the removal of the patients and the general sanitation of the dairies the situation cleared up.

The outbreak of 1908 resulted in agitation for and, in 1910, the adoption of a pasteurizing ordinance which has since been continuously in force.

The third outbreak occurred during the summer of 1928, and came as a complete surprise because the water supply is carefully supervised and chlorinated, and, except for certified and guaranteed milk which represents but 0.5 per cent of the 52,000 gallons daily distributed, all bulk milk is pasteurized. The process and machinery, thermometers and the pasteurized milk are carefully checked each week.

Except as above stated, no typhoid fever has occurred as a result of milk or water pollution for more than 20 years. San Francisco has always a number of cases of typhoid fever reported (see Figure I for 1928), but the source of infection has been traceable to water or other causes outside of the city and county.

The first intimation of infection in the 1928 outbreak came in May, when 4 cases were reported with a history of having been infected in San Francisco some time between the middle and latter part of April. At the time, a number of instances of diarrhea and bowel disturbances had been reported by physicians, but nothing definite was obtainable

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\* Read before a Joint Session of the Health Officers and Epidemiology Sections of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 2, 1929.

either from stools or urine to indicate that these were of typhoid origin. The department immediately checked on all the reservoirs supplying water, the pasteurizing plants, some 17, that were distributing milk in the city and county, and examined stools and urine from employees in these plants during the month of April.

In order to secure full coöperation of all health agencies, several conferences were held with federal and state authorities, the water company officials, and the milk and produce distributors. The reason for these conferences was the fact that after what seemed a careful survey of the water and milk supplies and the personnel of the pasteurizing plants, with negative findings, the report of cases continued.

There were a number of misleading circumstances surrounding the epidemiology of this outbreak. First, the age incidence was unusually high, 60 per cent (39 cases) occurring between 20 and 45 years—the active working age groups who drank milk with their lunches, which

FIGURE I  
TYPHOID CASE REPORTED—1928  
San Francisco Department of Public Health

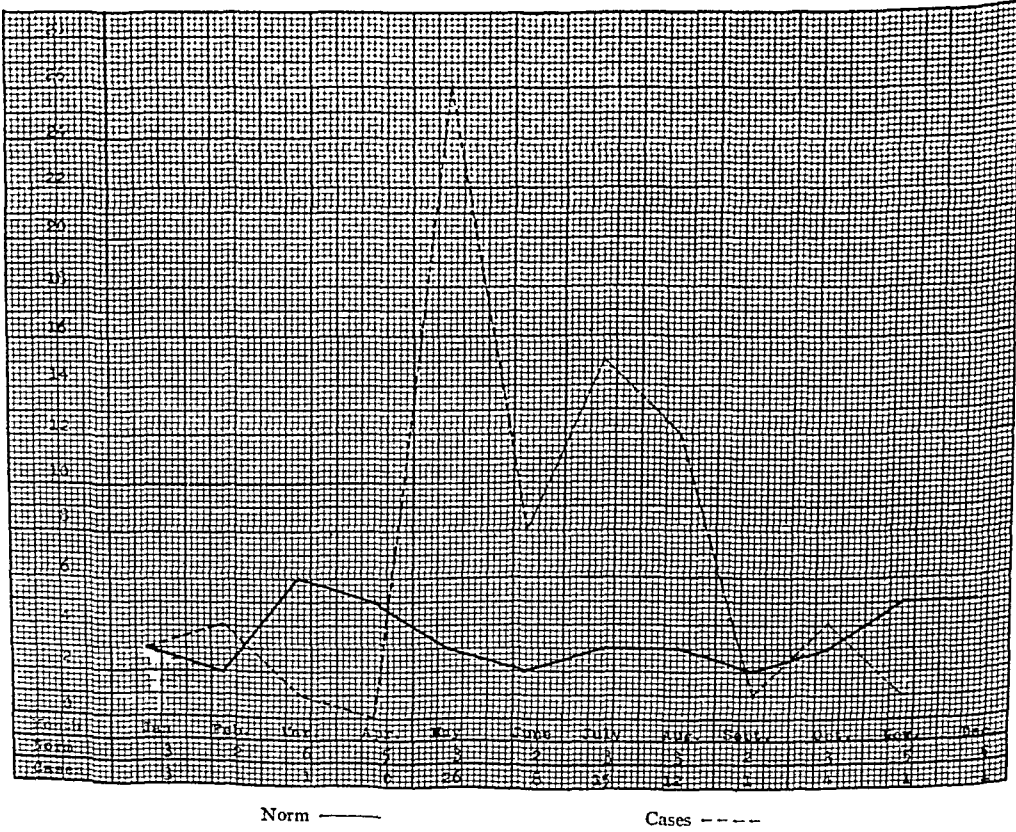
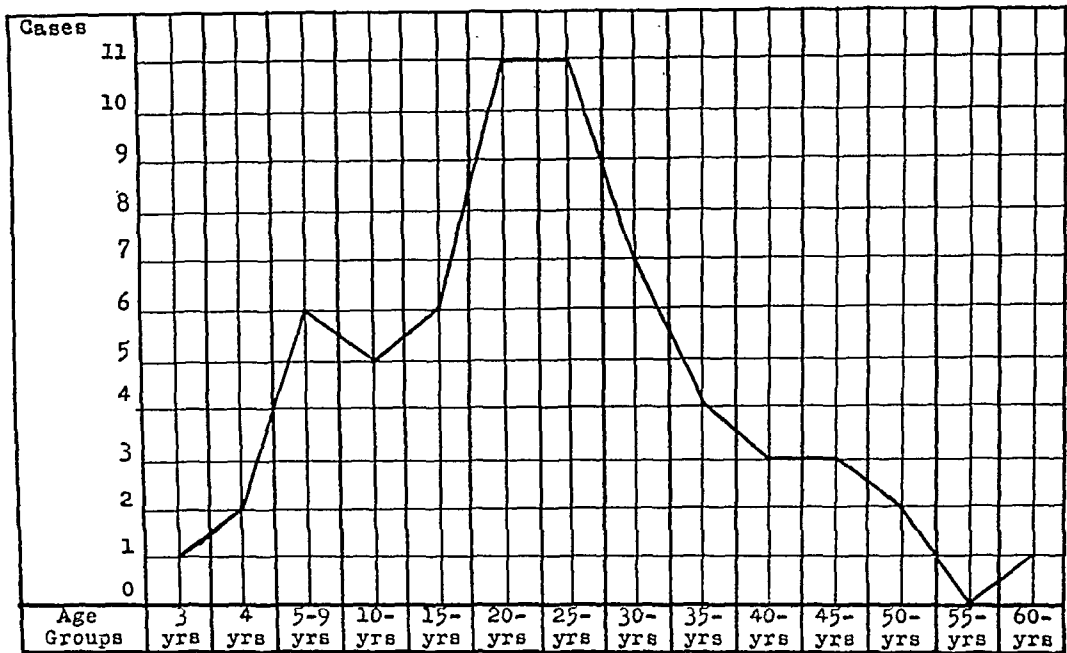


FIGURE II

AGE DISTRIBUTION—1928



had been pasteurized by one plant and sold directly from lunch wagons or neighborhood stores (see Figure II).








In Figure III it will be noted that 43 cases used milk from one of three sources. These three pasteurizing plants, located in different sections of the city, are under one management. Plant A, however, is the wholesale distributor to groceries, delicatessen stores, hotels, restaurants and lunch wagons where the cases were particularly concentrated. Plants B and C distribute only to family trade, but when short draw on plant A, a factor which later proved that the source of infection was plant A.

Figure II shows that there were only 14 cases under 14 years of age, the group that consumes the major quantity of milk in its dietary, and while 4 cases obtained their milk from three other dairies, additional milk was purchased from neighborhood stores, and these were supplied from plant 1.

Second, if the epidemic was due to milk, why were there not more cases? Figure I shows no cases in April, 26 in May, 7 in June, 15 in July, and 12 in August. The explanation must rest on the fact that at no time did the carrier pollute the entire supply on any one day, but only those bottles where the capping machine failed to function, and he dug out the faulty cap with his fingers and replaced it by hand. Another interesting fact was that when plants A and B needed extra

FIGURE III

SOURCES OF MILK SUPPLY. TYPHOID CASE—1928

DAIRY	CASES	
Riverdale	25	
Dairy Delivery	13	
Millbrae	5	
United	1	
California	2	
Golden State	1	
Unknown Source	2	
Canned Milk	1	
No Milk Used	2	

*10 Cases had double source of supply*

2 cases	Plant A and Plant D	1	"	"	D and	"	H
2	" " A and " G	1	"	"	D and	"	J
1 case	" A and " B	1	"	"	J and	"	K
1	" " B and " H	1	"	"	K and	"	E

No Case had more than two sources of supply.

The amount of milk sold by Plant A was 8,000 gallons daily, by Plant B 11,000 gallons daily, and Plant C 3,500 gallons daily.

The total milk supply of the city is 50,000 gallons daily.

milk it was always taken from the morning batch, which was directly under the care of the carrier, and it was also this milk that went to the stores and lunch wagons. The night pasteurized lot went to hotels, restaurants, and bakeries, and not a single case could be traced to milk obtained from these sources. This information came out only after the carrier had been removed from the plant, and in the effort to check up on the reason the epidemic was not more widespread.

The personal history of this carrier developed that he was unclean in his habits, and when necessary to use toilet he failed to wash his hands, although every facility was available, which I believe explains why only that portion of the supply was infected on which he replaced

TABLE I

TYPHOID CASES REPORTED DURING EPIDEMIC, 1928

(With Onset Dates and Source of Milk Supply)

Week  
Beginning:

Source of Supply	Total Cases	Apr 8	Apr 15	Apr 22	Apr 29	May 6	May 13	May 20	May 27	Jun 3	Jun 10	Jun 17	Jun 24	Jul 1	Jul 8	Jul 15	Jul 22	Jul 29
Plant A	25		16 18	23 23 24 25 25 27 27 28	30 30 May 2	6 7 10	13	26	Jun 1	4	11		25 25					Aug 1
B	13	11	15 21	28	29 May 1	10		20	Jun 1		12				12 12		28	
C	5			25	30								25 30				28	
D	1											20						
E	2							23		8								
F	1										10							
Unknown	2		21			6												
Canned Milk	1																28	
None	2								Jun 1 1									
Double Source																		
A & D	2		20 20															
A & G	2										15	21						
D & H	1				May 3													
E & K	1							25										
D & J	1										14							
J & K	1													3				
B & H	1																	Aug 4
A & B	1																28	

caps, coupled with the further fact that his stools were not at all times infective. What might have happened if he had capped all bottles by hand, as is done in some small dairies, is a question.

Third, the peculiar distribution of the cases as to the water supply, and an apparently unusual number of cases of diarrhea and bowel disturbance, justified the assumption that, in spite of chlorination, water was causing our trouble, and it was only later and after intensive study that water was definitely ruled out.

Each day the milk chart emphasized the fact that the milk of one plant harbored the infective agent, but, as stated, these facts came only after painstaking and intensive study of the situation.

#### WATER

An almost uniform occurrence of the earlier cases in the Laguna Honda Reservoir distribution area led to a careful study of this situation. This work might well be considered first, though the milk, vegetable and shellfish investigations were being carried on simultaneously.

The Spring Valley Water Company owns the water system of San Francisco. Its distribution is by three main supplies:

1. University Mound, a combination of waters from Crystal Springs and Alameda County sources, supplying the low area districts of the city, and comprising the principal commercial section, including heavy and light industrial districts, the financial district, the main hotel district and the residential section. The population of this supply is 260,000.

2. College Hill, a combination of waters from Crystal Springs, San Andreas and Alameda County sources, supplying the central section of the city, and comprising the light commercial and residential districts. The population of this supply is 80,000.

3. La Honda, one-half College Hill and one-half Lake Merced water. (La Honda water is sub-divided into Daly Hill, that part distributed before it reaches the Lake Honda Reservoir, and that which has passed through the Lake Honda Reservoir.) This supply reaches the higher levels of the city and comprises light commercial and better class residential districts. The population of this supply is approximately 320,000.

The cases considered were divided as follows: University Mound, 15 cases; College Hill, 6 cases; and La Honda, 41 cases.

Of the La Honda group, 12 were in districts supplied by this water before it reached the reservoir, and 29 after it passed through the reservoir.

Numerous tests were made of the La Honda water as well as that of other reservoirs. No faulty specimens were obtained from this reservoir, but from the following distributing reservoirs one specimen from each proved to be below the U. S. Treasury Standards, in that they showed the presence of *B. coli* in three tubes out of five tubes of 10 c.c. each.

The Francisco Reservoir	(University Mound Water)	July 14
Lombard Reservoir	(La Honda Water)	July 17
Potrero Reservoir	(La Honda Water)	July 17

All the other reservoirs, and these same reservoirs at other times during the investigation, gave favorable samples. Water was taken daily from 98 different locations throughout the city, and 22 samples showed water not up to U. S. Treasury Standards. We must consider

the tap fouling of some of the specimens. Two specimens were from College Hill sources, 9 from La Honda, and 11 were from University Mound.

The three main reservoirs of the above sources are open, but protected from animal pollution. With the exception of Lake Merced, the main reservoirs have wires stretched across them which prevent pollution by sea-gulls. The smaller distributing reservoirs all have roofs over them. All waters, prior to entering the main reservoirs, are chlorinated. Laguna Honda is chlorinated upon leaving Laguna Honda Reservoir. During the epidemic chlorination was required daily at the outlet of all main and distributing reservoirs.

In addition to this and to check our city water supply, samples were taken from 5 wells, 1 in a milk plant, 1 in a club, 1 in an orphan asylum, and 2 in business plants. The first 3 were below the U. S. Treasury Standards and were ordered closed. The water at the milk plant which was positive for colon bacilli on July 2, cleared up later.

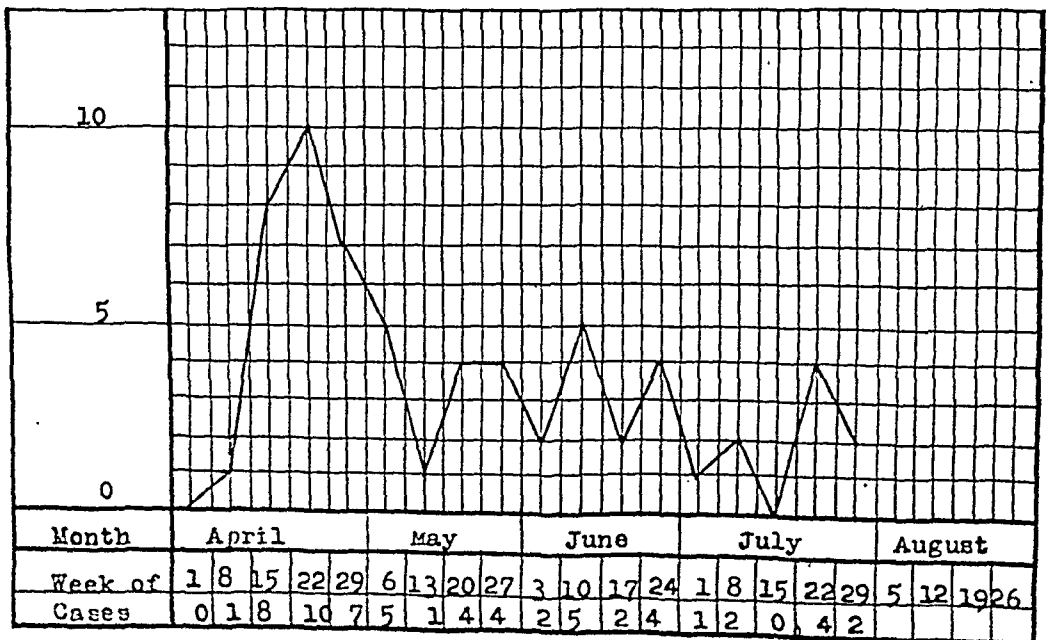
Six kinds of bottled waters were analyzed, and one was found not to comply with the standards and its sale stopped. None of the patients had used this water, so bottled waters were eliminated.

Samples of the ice supplied by the various companies to householders, restaurants, etc., were examined, and found to be excellent.

Three patients gave history of using 3 different swimming pools in

FIGURE IV

ONSET DATES—1928





this city. The routine tests of these pools showed them to be in excellent condition.

### FOOD

It being the season when strawberries were coming, the physicians for a time placed the blame upon this fruit, because nearly the entire supply is raised by Japanese and Chinese who were charged with using sewage for irrigation and as a fertilizer; but a careful check of the ranches where the berries were grown, and the market showed no pollution. Oysters, shellfish, and other similar articles of food were investigated, and eliminated because of negative findings.

### MILK

Early in the outbreak a careful survey was made of the pasteurizing plants, and all were found to be functioning properly. None of the cases were users of certified or guaranteed milk.

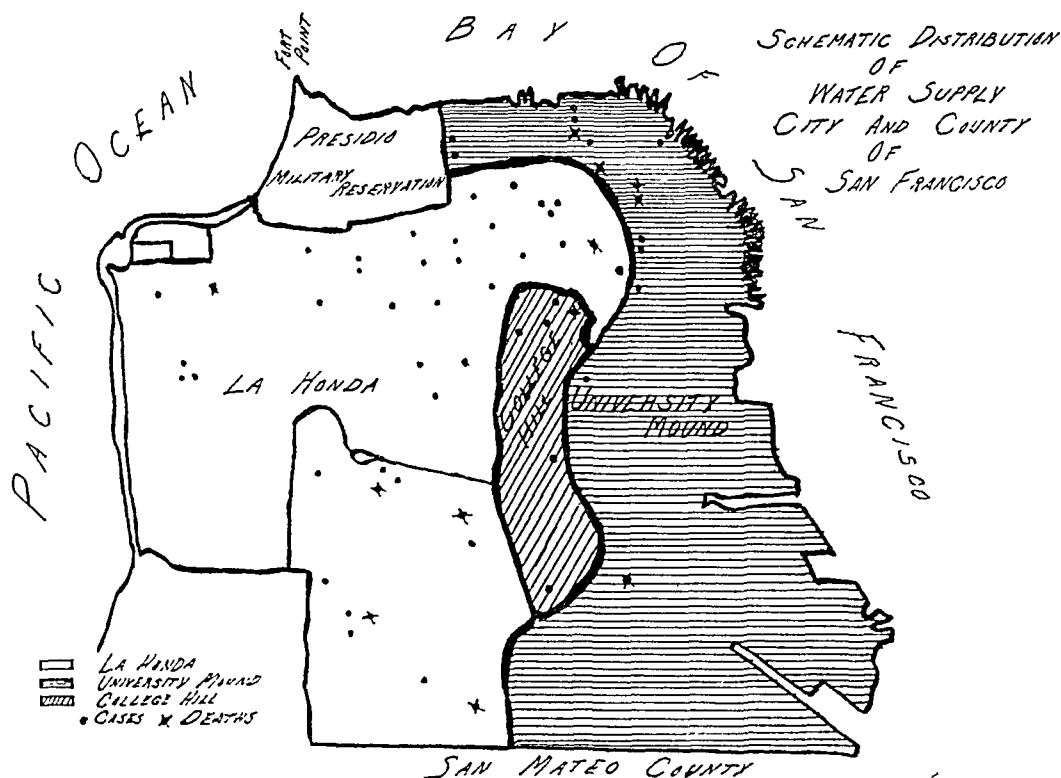
The cases, however, continued. Water and milk were then subjected to a more intensive study that definitely eliminated water, but pointed to a subsidiary plant of one of the large milk distributing depots; so it was determined to make a second examination of the employees of this particular plant. To make sure that none should escape, or substitute another's specimen, the tests were made in groups of 5. Each group was required to enter the Outpatient Service of the Municipal Hospital. A vigorous laxative was administered and specimens of stool were collected by the doctor in charge. One sample was sent to the State Hygienic Laboratory and 1 to the Department of Health Laboratory.

The state found what it believed to be a carrier in a man engaged as a truck loader. Our own laboratory could not confirm this but found a positive specimen from a man engaged on a bottle-capping machine. Both of these men were immediately removed from duty, and taken to the Isolation Hospital where they remained nearly 4 weeks, during which time repeated specimens were secured. The bottle capper gave positive stools consistently, and the truck loader, even with most vigorous laxatives and drainage of the gall bladder, gave negative results. He was released from custody but removed from the milk plant. The bottle capper was released after signing a statement prepared by the State Board of Health agreeing not to engage in milk work or the handling of food stuffs.

Neither of these men gave a history of having had typhoid fever. The bottle capper had been employed for 2 years preceding the outbreak. His removal from the dairy ended our outbreak. That this case escaped attention on the first examination brings out two impor-

tant facts frequently overlooked in field work: The organism may lose its vitality in old feces of constipated persons, but shows in numbers when these individuals take a physic; therefore, the suspected person should be given a thorough cleaning out before taking specimens of stools. Further, where cases can be traced to a dairy, even though results be negative at first, second and third examinations should be made, as carriers may be quiescent for a time, then become active and a menace to life and health. This carrier was the cause of most, if not all, of the 62 cases, 12 of which terminated fatally.

FIGURE V



This milk-borne epidemic is 1 of 8 instances in the United States where infection occurred subsequent to pasteurization. An analysis of the 17 milk-borne outbreaks charged to pasteurized milk shows that in 3 instances raw milk was substituted after pasteurization had been completed; in 3 the milk had not been pasteurized properly; in 2 was heated in a starter can; in 2 there were faulty equipment and faulty flash methods; and in 7 information was not obtainable. The conclusion is that pasteurization was not at fault in any of the 8 outbreaks, but that through the medium of a carrier, the milk was infected at some stage of bottling or handling of the finished product.

## AIMS AND PURPOSES

The aim of every health officer is to create safeguards and conditions that will prevent milk-borne typhoid fever infections. How this can best be done is still a subject of controversy. The preponderance of evidence is that the pasteurization of clean milk by employees of known health will eliminate this menace. Where pasteurization has failed in the past, the fault lay in improper methods, or in not knowing the health of those who handled the product after processing.

The purpose of the pasteurization of milk is to make clean milk safe for the consumer, and not to make dirty milk clean, or its contamination inert. The argument of some pediatricians and general practitioners that raw milk is better than pasteurized for infants and children because the vitamins are destroyed by pasteurization has been repeatedly disproved. By pasteurization\* we mean the heating of all portions of clean milk to a temperature of not less than 140° F., nor more than 145° F., holding it for 30 minutes, then rapidly cooling the product to 50° F. or lower and putting it in sterile bottles.

## CONCLUSIONS

1. The almost uniform occurrence of the earlier cases in the Laguna Honda reservoir water distribution area justified the active steps taken to study this water supply.

2. The small number of cases in children among the earlier groups pointed away from milk-borne epidemic.

3. The outbreak occurring simultaneously with the advent of strawberry season justified the slight suspicion that strawberries might be the source of infection.

4. The department was satisfied that upon the first indication of numbers of cases having their milk supply from the Riverdale plant, the cause lay in this plant, and began taking stools and urine of employees immediately. The fact that the carrier who is considered the responsible person was required among the very first to submit a stool, which was found to be negative, though the later stools proved positive, shows that even at that time the epidemiological work done would have solved the problems, but for a possible fault in laboratory or administrative technic.

5. The epidemic could not be charged to faulty pasteurization, but to a carrier handling the finished product.

6. The importance of knowing that all persons engaged in handling or processing milk are free of communicable disease, and that examinations attesting this fact shall be made not less than once each year, is manifest.

7. All milk, not excepting even certified or guaranteed, should be pasteurized before distribution to the consumer.

## REFERENCE

1. Drinking Water Standards, *Pub. Health Rep.*, Apr. 10, 1925.

\* This definition is the writer's. No temperature has been officially adopted for pasteurization. The standard of the A. P. H. A. requires at least 142° F. for 30 minutes. Ed.

# First Aid Cabinet of a School Nurse, Her Standing Orders for First Aid, and Her School Nursing Procedure\*

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IT would appear that there should be two parts to this paper, one dealing with the nurse's equipment and first aid activities and one with her other school nursing procedures. They can be discussed in a related manner if we consider both the first aid and other activities from the viewpoint of the school nurse as an educator.

All public health workers must be educators, but the school nurse has particular responsibilities along this line. She is working with an organization which has for its goal the preparation of children for life, through the processes and activities we call education. The leaders of this organization, the superintendents and principals of schools, have proclaimed by means of individual statements and through committees of their national organization that their first objective is the health of the child—present and future. To help them realize this objective there are school nurses and school physicians. The nurse, working with our educational institutions, and frequently employed by them, must consider herself an educator, and take advantage of every opportunity to increase her knowledge of educational aims and to increase her skill in educational methods.

The nurse is not always at the school building when first aid treatment is needed, and children will have accidents away from the school; consequently it is desirable that teachers and pupils be taught how to take care of the minor accidents that occur in school or on the playground. Every case that comes to the nurse should be considered by her as an opportunity for education in the principles and methods of first aid treatment. The interest of the child is aroused and he is anxious to know what to do and how to prevent further trouble. The hows and whys of the treatment should be explained in words that can be understood by the child. Perhaps the most important explana-

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\* Read before the Public Health Nursing Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 4, 1929.

tion that the nurse can give is in regard to the application of, and the need for, sterile dressings. There are still many children and parents who do not realize the danger of infection being carried into cuts and abrasions from outside sources and from soiled cloths put over wounds. They should be taught that cleaning a wound and keeping it covered with a sterile dressing are the most important factors in its healing—more important than the application of various kinds of ointments.

Although words are needed for explanations, much is taught without words. The nurse should watch her technic carefully, and realize that her methods will be imitated. She should realize that her reaction to the case will affect the child's attitude in regard to its care and prognosis. She should exhibit a sympathetic attitude, taking care not to exaggerate the importance of slight injuries, while urging the proper care of serious ones without alarming the child.

What are the principal conditions which the nurse will be asked to treat? The majority of cases will be cuts, bruises and abrasions resulting from falls on the playground or in the school building. There will be cases of toothache which the child will expect to be relieved immediately. There will be cases of foreign particles in the eye. Besides these, nurses are also called on to treat, or to teach the mother to treat, cases of scabies, impetigo and pediculosis.

What materials should be kept in her first aid cabinet to treat these conditions? The following list is adequate:

Tongue blades	Ammoniated mercury	70% alcohol
½ and 1½ inch roller	ointment	Zinc oxide ointment
bandage	Adhesive tape	Green soap
Absorbent cotton	Thermometer	Aromatic spirits of am-
Mercurochrome solution	Scissors	monia
Tincture iodine	Medicine dropper	Boric acid solution
Oil of cloves	Paper towels	

When called upon to treat certain conditions, the nurse will need a supply of sulphur ointment, bichloride tablets or kerosene. It is not necessary, however, to keep these materials in her first aid cabinet.

Standing orders in regard to treatment may best be outlined according to the various types of cases:

*Cuts and Abrasions*—Clean the wound thoroughly. Cleaning is the most important first aid measure. The area may then be swabbed with mercurochrome, a dry sterile dressing applied and held in place with a roller bandage.

*Toothache*—The nurse should see that every child who is sent to her on account of a toothache makes an appointment with the dentist, preferably with the family dentist; but if the family is unable to afford such services the child should be sent to a dental clinic or school den-

tist. The nurse should see that the appointment is kept. Teachers and parents should be made to feel that a child with an aching tooth has been neglected. Attention and regular dental examinations will eliminate the nurses' toothache problem. First aid treatment consists of removing particles of food from the cavity and inserting a pledget of cotton saturated with oil of cloves.

*Foreign Particles in the Eye*—Foreign particles located on the eyeball or the lower lid are readily seen and may be removed by gently touching them with a piece of cotton on a toothpick. If a cinder, or other particle, is on the upper lid, the lid must be everted before a good view can be obtained. This is not difficult and practice will develop a skill that permits one to evert the lid with little or no discomfort. After the particle is removed it is well to wash the eye with a solution of boric acid. In removing a foreign particle the nurse should touch the particle with the cotton pledget very gently. If the object is not readily removed, the nurse should immediately refer the case to a physician.

*Impetigo*—This is contagious and children with impetigo should be excluded from school. The treatment consists of thorough cleaning, including removal of all crusts, followed by the application of an antiseptic dressing, as ammoniated mercury ointment.

*Pediculosis*—The parts affected should be vigorously scrubbed with soap and water, then thoroughly washed with a 1-500 solution of bichloride of mercury or with kerosene. The ova which are killed by this treatment may be loosened from the hairs and removed by washing with vinegar or 5 per cent acetic acid. The clothing should be carefully examined and if infested be sterilized. Children with live pediculi should be excluded from school.

*Scabies*—The treatment of scabies needs to be undertaken in a systematic manner if it is to be effective. The ointment frequently recommended consists of 4 parts of lard to 1 part of powdered sulphur. This is smeared over the body for three nights, and followed each morning by a warm soap bath. Clean clothing should be put on each morning, the soiled clothing being thoroughly cleaned.

Many school health departments have forms on which are printed directions for the treatment of scabies and pediculosis together with the drugs to be used. These forms are very convenient and save the nurse considerable time.

It will be well to state what conditions the nurse may treat and what her general policy should be in regard to treatment. As a general policy I suggest this: A school nurse should not accept responsibility for the treatment of any condition—she may treat cases on

orders of a physician when he assumes the responsibility, but otherwise her activities are to be limited to first aid. All cases requiring treatment should be referred to the family physician or clinic physician and, regardless of the need of any individual case, the nurse should not treat it except on instructions from a physician. In some school systems the school physician will give nurses general instructions as to the treatment of scabies, pediculosis and mild cases of impetigo which have been neglected. In such instances, the responsibility is the physician's, even though he does not see the case.

Pediculosis may be considered an exception to this general policy. I can see no objection to the nurse undertaking the treatment of this condition.

Cases of scabies, impetigo and pediculosis are associated with a lack of cleanliness of the body and of the clothing. Every case is an opportunity for instruction in personal cleanliness. It is not one child that has to be instructed, but the whole family.

First aid work and minor treatments are important parts of the school nurse's duties, but they should occupy but a small portion of her time. The success of a nurse in her first aid work is not measured by the number of cases she treats, but by her proficiency in teaching older children, parents and teachers to take care of these conditions. As she is able to do this she will have more time to devote to more important duties, such as classroom inspections and home visitations.

Classroom inspections are a valuable part of the nurse's activities. Their purpose is to detect the presence of any signs indicating the onset of acute communicable diseases, and physical defects that may be remedied. The usual method is for the nurse to stand with her back to the window while the pupils pass by her in line. As a pupil approaches he pulls down the lower eyelid, exposing the conjunctiva. Then the mouth is opened and the head thrown back, to observe the pharynx, tonsils and teeth. Pupils are asked to show their hands, palm and back, with the fingers spread. The skin of the hands, arms, face and neck is thus exposed. The hair is inspected for the presence of pediculi.

By such an inspection the nurse is able to observe some of the common signs of the communicable diseases, flushed face, rash, reddened or watery eyes, running nose, and inflamed throat. She will also notice some children who are urgently in need of dental attention, and some whose tonsils are abnormal. The general appearance of some will lead her to refer them to a physician for further examination. She will take others to the school office or examining room for

a better inspection, for example, pupils whose throats are not visible without the use of a tongue depressor.

When doing classroom inspections, as in first aid work, the nurse is primarily an educator. In the case of inspections, the teacher is being educated, and the nurse's aim is to help the teacher to obtain the knowledge and skill necessary to conduct intelligent and useful health inspections of her pupils. Inspections to detect cases of communicable diseases are of little value unless conducted daily. It is impossible, in any school system, to have a nurse inspect every pupil every morning, but teachers can make such inspections. Most teachers have had no training along this line, and until normal schools supply those who have had such training it will be a function of the school nurse to train them.

On entering a room to make a health inspection, the nurse should acquaint the teacher with the purpose of the inspection and convince her of its value. This may be followed by a statement in regard to the danger of allowing a child to stay in a classroom when in the early stage of a contagious disease. A fact to be emphasized is that the various children's diseases are most contagious in their early stages. Following such an explanation the nurse makes an inspection while the teacher looks on. The nurse carefully demonstrates to the teacher any condition which she regards as a deviation from the normal. At a subsequent visit the teacher may make the inspection while the nurse looks on. Questions in regard to the practice of health habits may be asked at this time. Commendation for children who have practiced the health habits taught, or who have had remediable defects corrected, helps to develop a favorable group attitude.

There are two points requiring emphasis when the teacher is asked to make health inspections. One is that the teacher need not touch any pupil. The inspection is made through the eyes, and the danger of passing an infection from one child to another is eliminated by instructing the teacher not to touch any pupil. The other is that the teacher should not diagnose any condition which she observes. The diagnosis is the province of the physician who is going to treat the case. The teacher is not interested in what disease the child has. She is interested only in determining the presence or absence of any deviation from normal which indicates that the child may be suffering from some acute disease. When she finds such a deviation she excludes the child from school for the protection of the other pupils. The exclusion is not based on the diagnosis of any definite disease, but solely on her suspicion due to changes in the appearance of the child.



The most important duty of the school nurse and the one of greatest value is the home visitation. She may educate parents, pupils and teachers to decrease the need of first aid services, and teachers can develop such skill and experience in conducting inspections that the nurse can be relieved of much of this activity; but none can relieve her of the responsibility and privilege of home visitation. In this work she acts as a correlator of the work of the school and the home in promoting the growth and development of the child.

The first objective in making a visit is a friendly contact with the home, a contact that will help to create in the parent a coöperative attitude toward the activities of school and health officials. Words of commendation or praise in regard to the child will help to develop this. No defect or remediable condition should be mentioned until the nurse has spoken of every favorable condition. Consideration must be given to the point of view of the parent, who should have an opportunity to express her knowledge and opinion of her child. Particularly in regard to protection against diphtheria and smallpox, the nurse must recognize and respect the right of a parent to decide whether or not a child is to receive such treatments. Protection should be urged, and the nurse should give all the facts she can about such treatments, but never in such a way as to antagonize a parent. It means more to keep the good will of an individual than it does to increase by a fraction the percentage of children protected.

Home visits are made for various reasons. Some are to inform parents of conditions in a child that are interfering with his school progress or hindering his proper growth and development. Others are to have the mother consider changes in the school program, it being thought that the child would benefit by omitting some work, or by being in an open window room. Many visits are made for the purpose of talking with parents regarding the health habits of the child and having him vaccinated against smallpox or diphtheria. Regardless of the primary reason for making the home call, there are a few underlying principles that may be followed.

The first is that every child be considered as a whole child, and not as made up of tonsils, teeth, eyes, ears, etc. The immediate reason for making the home call may be to give information regarding clinical facilities for tonsillectomy, but while talking about tonsils the nurse should discuss the child's health from all angles—his nutrition, his practice of health habits, and his behavior. In regard to the latter, the value of mental hygiene is recognized everywhere, and the school nurse should be prepared to advise in regard to mental as well as physical hygiene.

The second is that the nurse consider the family as a whole, and not only the child. Where a generalized public health nursing program is in effect this idea is carried out to perfection, but in many places where nurses do school nursing only, there is a tendency for them to ignore members of the family. A knowledge of the health condition of the father and mother may help to understand better the conditions she finds in the child. The preschool child should receive particular attention.

As a third principle, I contend that every home visitation should be educational, the nurse considering herself as an educator, and her aim the instruction of the parent in regard to the child's condition and the fundamentals of physical and mental hygiene. Regardless of the reason for the visit, the close should find the mother in the possession of some health knowledge which she did not have before. When leaving, can the nurse answer "yes" to the questions, "Have I given the parent some ideas that will enable her to care better for the health of her children?" and "Have I helped her to realize that the most important thing that she can do for them is to guard their health?" If she can answer "yes," then her visit has been educational.

My opinion in regard to the status of the school nurse is evident from the brief discussion of three of the important procedures in her program. I regard her as a health educator working with an institution which considers health as an important objective. She is a specialist in child health, and, as such, is capable of advising teachers and parents in matters pertaining to the physical and mental health of children. She avoids duplication of activities that can be taken care of by parent or teacher, and correlates their efforts to develop a nation of strong, robust children.

With this opinion of the status of the school nurse, the standing orders of the school nurse in regard to first aid, classroom inspections and home visitation, may be summarized as follows:

#### FIRST AID

1. Consider each case referred to you as an educational opportunity.
2. Advise home care of minor accidents which occur at home and after school.
3. Let older pupils learn first aid treatment by doing their own first aid work under your supervision.
4. Accept no responsibility for treatment. (The treatment of pediculosis may be considered an exception.)

#### CLASSROOM INSPECTION

1. Inspect all pupils as early as possible each semester.
2. Educate each teacher in the methods of health inspection. Plan to super-

vise an inspection which she makes. Impress upon her the importance of daily inspections for the control of communicable diseases.

3. Do not diagnose any condition found.

4. Do not touch children during classroom inspection; if more detailed inspection is needed, have the child report to the office or examining room.

#### HOME VISITATION

1. Allow nothing to encroach upon the time allotted for visits to homes—it is the most valuable part of your work.

2. Be tactful; avoid antagonizing parents and help them to develop a sympathetic and understanding attitude toward health and school officials.

3. When making a home call consider the child as a whole, and be interested in the whole family.

4. Make every visit a health lesson for the parent.

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## Sterilization for Human Betterment

THE final summary of the problem, as estimated by Gosney and Popenoe in their book of this title, after studying the results of over 6,000 operations done in a period of 20 years, is conservative but important. No such extensive experiment in this field of endeavor has ever been carried on before. They feel that the experiment has been a distinct success. There have been practically no bad effects; there are rare failures of the operation; the mortality is practically nil, and the results are, presumably, all that could be expected. It certainly tends to prevent the birth of many inferior children, thereby allowing the proportion of superior children born in the population to increase. It also reduces definitely the burden of caring for defectives and dependents.

The program of sterilization for eugenic reasons is usually considered as purely a negative measure, but the authors of this interesting book believe that that is only part of what physicians and others should advocate. There should always be a positive program for the encouragement of good breeding to go along with the negative one of sterilization.—Editorial, *New England J. Med.*, Oct. 31, 1929, p. 893.

## Anthrax as an Occupational Disease\*

HAVING presented statistical reports at two previous meetings of this section, in 1925 and 1927, on the prevalence of anthrax infection in industry, your committee was asked to report again this year, so that an indication might be had as to the present trend of the anthrax menace.

The collection of reliable data as to anthrax infection has each time presented a difficult problem, and our reports are given with the distinct understanding that they represent an understatement of the prevalence of the infection. We are glad to report that this year we have obtained data from more states than formerly, and more states reporting have been able to give us some definite information as to probable sources of infection, location of lesions, and methods of diagnosis and of treatment.

In 1925 we reported cases and deaths from 15 states over a period of  $5\frac{1}{2}$  years. In 1927, 30 states were heard from, reporting for a  $3\frac{1}{2}$ -year period, 23 of the 30 reporting one or more cases. The present report covers from January 1, 1927, to July 1, 1929, overlapping the previous one by 6 months. This report lists returns from 38 states, 21 reporting cases or deaths, or both, with 17 reporting no cases. Of the latter, 2 report animal anthrax and infer that human anthrax may have occurred but not been reported. Some states, reporting deaths only, state that as anthrax is not reportable they have no figures as to its prevalence.

Table I lists 162 anthrax cases with 30 deaths, as compared with 222 cases and 25 deaths for the corresponding  $2\frac{1}{2}$ -year period in the 1927 report. This is an encouraging decrease in number of cases, but a definite increase in mortality, from 11.27 to 18.5 per cent. Six states reporting cases between 1924 and 1927 report no cases since July 1, 1927 (Delaware, Indiana, Kansas, Kentucky, Minnesota and Virginia); 2 states reporting no cases previously report cases in the 1927-1929 period (Florida and Maine); and 3 not heard from before report cases this time (Arkansas, Oregon and Rhode Island). The tannery states, Massachusetts, New Jersey, New York and Pennsylvania, continue to report cases each year, but only New York shows any appreciable increase. Of the 37 cases reported from that state, 23 were

\* Report of the Committee on Anthrax presented to the Industrial Hygiene Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 3, 1929.

TABLE I  
ANTHRAX CASES AND DEATHS IN 38 STATES

STATE	Total for Period		1927		1928		1929 to July 1	
	Cases	Deaths	C	D	C	D	C	D
Arizona	0	0	0	0	0	0	0	0
Arkansas	6	4	3	2	3	2		
California	7	1	1	0	6	1	0	0
Connecticut	4	0	1	0	2	0	1	0
Delaware		0		0		0		0
Florida	1	1	0	0	0	0	1	1
Georgia	0	0	0	0	0	0	0	0
Illinois	1	1	0	0	1	1	0	0
Indiana	0	0	0	0	0	0	0	0
Kansas	0	0	0	0	0	0	0	0
Louisiana	9	1	3	0	6	1	0	0
Maine	1	1	1	1	0	0		
Maryland	0	0	0	0	0	0	0	0
Massachusetts	20	1	5	0	8	0	7	1
Minnesota	0	0	0	0	0	0		
Mississippi	5		4		1			
Missouri	2	1	1	1	1	0		
Montana	0	0	0	0	0	0	0	0
Nebraska	0	0	0	0	0	0		
New Hampshire	1	1	0	0	1	1		
New Jersey	16	3	6	0	10	3		
New Mexico	0	0	0	0	0	0	0	0
New York	37	6	12	3	16	2	9	1
North Carolina	1	1	1	1		0		0
Ohio	2		0		2			
Oklahoma	0	0	0	0	0	0		
Oregon	7	0	1	0	6	0	0	0
Pennsylvania	29	8	6	2	15	5	8	1
Rhode Island	1	0	0	0	1	0	0	0
South Carolina	0	0	0	0				
South Dakota	0	0	0	0	0	0	0	0
Tennessee	5	0	2	0	3	0		
Texas	7	0	0	0	6	0	1	
Virginia	0	0	0	0	0	0	0	0
Washington	0	0	0	0	0	0	0	0
West Virginia	0	0	0	0	0	0	0	0
Wisconsin	0	0	0	0	0	0	0	0
Wyoming	0	0	0	0	0	0	0	0
Total 30 states	162	30	47	10	88	16	27	4
Per cent fatal	18.5		21	18.1	14.8			

C = cases

D = deaths

Blank spaces indicate no report for that year

traceable to wool handling (in the last report Massachusetts had 18, New Jersey 27, New York 29 and Pennsylvania 42).

Table II lists cases and deaths by states and sources of infection, but not by year of occurrence. In 1927, 18 out of 23 states reported one or more cases in which the sources of infection had not been determined, while now only 14 of the 21 reporting list such cases. This is a distinct improvement.

TABLE II

ANTHRAX CASES AND DEATHS IN 21 STATES: BY SOURCES OF INFECTION

January 1, 1927, to July 1, 1929

	Tannery		Wool		Live Stock		Shaving Brush		Horse Hair		Leather		Laboratory Infection		Source not reported	
	Cases	Deaths	C	D	C	D	C	D	C	D	C	D	C	D	C	D
Arkansas	—	—	—	—	6	4	—	—	—	—	—	—	—	—	—	—
California	—	—	—	—	4	0	—	—	1	0	—	—	—	—	2	1
Connecticut	—	—	2	0	—	—	—	—	1	0	—	—	—	—	1	—
Florida	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
Illinois	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
Louisiana	—	—	—	—	4	0	—	—	—	—	—	—	—	—	5	1
Maine	—	—	—	—	—	—	—	—	—	—	—	—	—	—	1	1
Massachusetts	15	0	3	0	—	—	—	—	1	0	—	—	1	1	—	—
Mississippi	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	—
Missouri	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	1
New Hampshire	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—
New Jersey	13	2	2	1	—	—	1	0	—	—	—	—	—	—	—	—
New York	8	0	23	2	1	1	1	1	1	0	2	0	—	—	1	1
North Carolina	—	—	—	—	1	1	—	—	—	—	—	—	—	—	—	—
Ohio	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2	0
Oregon	—	—	—	—	4	0	—	—	—	—	—	—	—	—	3	0
Pennsylvania	10	3	12	1	—	—	—	—	6	3	—	—	—	—	1	1
Rhode Island	—	—	1	0	—	—	—	—	—	—	—	—	—	—	—	—
Tennessee	—	—	—	—	—	—	—	—	—	—	—	—	—	—	5	—
Texas	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7	—
Total States reporting	46	5	43	4	21	7	2	1	10	3	2	0	1	1	37	8
	4	2	6	3	7	4	2	1	5	0	1	0	1	1	14	7
Per cent fatal 14.8	10.8		9.3		33		50		30		0		100		21.6	

C = cases  
D = deaths

This table, taken with Table III showing the percentage of cases traced, or untraced in this report and in the previous one, shows a definite shift in the picture of anthrax infection. Forty-six cases are

TABLE III  
PER CENT OF REPORTED CASES TRACED TO SOURCE  
(based on total of traced cases)

Source	1924-1927	1927-1929	(6 mo. overlap in data periods)
Tannery and Leather	46	36.8	
Wool	28	34.4	
Live Stock	11	16.8	
Shaving Brush	3	0.8	
Hair and Fur	7	8.0	
Professional	2	0.8	
Per cent of cases untraced	52 -	22 +	

traced to tanneries or tannery products, 36.5 per cent as against 46 per cent in the last report. This represents a yearly average of 18 + cases, as against slightly over 19 in the former report.

The 1927 report showed wool an increasing source of infection and prophesied that this increase would continue. In 1925 wool was responsible for less than 3 per cent of the traced cases, in 1927 for 28, and in this report for 34.1 per cent. There were 43 cases, or 17.2 per year, as against 12 per year in the 1927 report. This is a definite increase in cases as well as in percentage.

Anthrax due to animal infection is apparently also on the increase, and we feel sure that the tables understate this increase. In some states, where no other industrial sources are listed, some of the cases not traced were undoubtedly due to infection from livestock. The 1927 report listed an average of less than 5 cases per year traceable to this source, or 11 per cent of the traced cases. This report lists 21 cases so traced, 8.4 cases per year, or 16.6 per cent of the traced cases. Either anthrax from animal contact is on the increase or these cases are being much more often recognized. In the 1927 report only 3 states listed such cases, while in this report 7 do so, 2 others inferring that there were probably such cases unreported where animal anthrax was recognized. Three of four animal source cases in one state (Oregon) were definitely traced to fly bites, the flies acting as carriers from sick animals.

The shaving brush menace, so alarming some years ago, seems to have almost entirely disappeared, as only 2 cases were reported from this source in the 2½-year period. There is little change in the incidence of anthrax from horse hair. One fatal case of infection in a laboratory worker is reported.

The last line in Table II shows the percentage of fatalities in each source group. With a general fatality of 18.5 per cent, that from tannery anthrax is 10.8, from wool 9.3, from untraced cases 21.6, from

horse hair 30, and from animal contact 33 per cent, the last an extremely high fatality from any infection introduced through skin lesions. The high fatality in untraced cases is probably due to the predominance of animal contact infection in this group. This high fatality rate from animal contact cases cannot be blamed on lack of serum treatment, as 5 of the 7 received serum. The high rate for horse hair is based on only 10 cases and may or may not be significant.

This year's questionnaire for the first time elicited sufficient information as to methods of diagnosis, treatment, and location of lesions to allow of tabulation. These data are given in Table IV.

TABLE IV

<i>Diagnosis—where reported</i>		Total Cases	Fatal
Cases diagnosed clinically only		93	7
" " by laboratory		46	10
<i>Location of Lesions—where reported</i>			
Limbs		43	1
Trunk		4	1
Face; neck or head		64	8
Internal		1	1
<i>Methods of Treatment—where reported</i>			
Serum		59	10
Serum and surgery or antiseptics		36	2
Antiseptics or surgery, or both		18	1

Of the 162 cases, 93 were reported as diagnosed clinically, and in 46 other cases laboratory aid was obtained. No data were given for 23 cases.

Types of lesions were classified in four groups: (1) limbs, hands or feet, 43 cases with 1 death; (2) face, head or neck, 64 cases with 8 deaths; (3) trunk, 4 cases with 1 death; (4) one fatal case of internal anthrax from horse hair. These figures agree with the general conception of relative danger. In the remaining 50 cases there was no information as to site of lesion.

Fifty-seven cases were treated with serum alone, with 10 fatalities—5 in those due to animal contact. Thirty-six cases received serum and surgical aid, with 2 fatalities, and 18, 1 of them fatal, received no serum. Treatment was not reported for 49.

## SUMMARY

1. An apparent increase in interest in anthrax infection as evidenced by increasing detail in reports, especially as to tracing infection, diagnostic methods, infection sites and methods of treatment.



2. A general decrease in the number of cases reported, confined to tannery and shaving brush infections, the latter being almost negligible. No decrease in infection from horse hair and a definite increase from wool handling and contact with livestock.

3. A comparatively low fatality from tannery anthrax, due to constant watchfulness and prompt intelligent treatment, and an alarmingly high fatality in anthrax from animal contact, possibly due to the rapid spread of many actively growing vegetative bacilli introduced into wounds, as against the longer incubation necessary for the development of the comparatively few spores derived from the handling of hides, skins, or hair.

HENRY FIELD SMYTH, *Chairman*  
VOLNEY S. CHENEY

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## Undulant Fever Germs Hard to Kill

ORDINARY pasteurization methods will not kill the porcine strain of the undulant fever bacillus. This has been demonstrated by Dr. Lloyd Arnold, professor of bacteriology and pathology at the medical college of the University of Illinois and head of the Chicago branch of the diagnostic and research laboratories of the State Department of Public Health, who found that 40 minutes at 140° F. were required to kill the porcine strain of the undulant fever organism.

Whether or not the ordinary milk pasteurization process would so attenuate the bacilli as to render them harmless has not been determined by Dr. Arnold.—*Illinois Health Messenger*, Jan. 1, 1930.

Tests at the New York State Veterinary College have also shown that the abortion bacillus of the porcine strain is not killed by pasteurization at 140° F. for 15 minutes. Experiments on electrical pasteurization by Drs. Huddleson and Carpenter at the Michigan State College indicate that the flash continuous flow method at 160° F. is efficient. In one case, however, the abortus resisted 155° F., though tubercle bacilli were killed.

It is evident that the prevention of undulant fever, especially that caused by the porcine variety of the causative organism, presents a new problem in pasteurization.

# Some Difficulties in the Collection of Records\*

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THE records discussed in this paper are those secured and maintained in bureaus of vital statistics. The purpose is not to present the discovery of some new method by which records may be collected with entire completeness and accuracy, but rather to start a discussion by the members in our section with a view to an exchange of ideas, thereby bringing about a more sympathetic tolerance for the "other fellow" after viewing the difficulties that must be surmounted before he attains results.

This section brings together representatives of many different institutions having to a certain degree a common interest since the problems affecting one, to some extent at least, affect all. For convenience, let us divide the membership of this section into two groups; those in the first group to include the highly trained statisticians who are equipped to study scientifically and interpret results; the second group to include registrars whose first obligation is the responsibility of securing original records. For many years, I have attended every meeting of our section with an eagerness for more information and new ideas and have gleaned from the papers, discussions and personal contacts, information that has been an inspiration for harder work and more interest in my own department.

We all have our difficulties, we all belong to the same section, and still one member's difficulties are often very remote or unusual to those of another. It is, therefore, with this in mind that I have for a number of years looked forward to a section meeting when a general discussion would bring our members to a better mutual understanding. In my opinion, the splendid work of our special Committee to Aid Completion of the Registration Area, under the leadership of Dr. Dublin, has accomplished a great deal more than the annexing of additional states to the area. It has enlarged the scope of sympathetic feeling between the two groups.

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\* Read before the Vital Statistics Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 2, 1929.

One of the greatest difficulties in collecting records is finances. Legislatures should be shown why large appropriations are needed, and, when given, every cent should be spent—wisely, of course, but spent. One of the surest ways to gain recognition is by the judicious spending of money for health purposes. Money in the state treasury may aid in checking an epidemic, but it is far better to prevent the epidemic by spending the money in protecting those who would have suffered.

States and cities with enormous populations usually have financial resources with which to collect and study records. The man highly and technically trained in the science of numbers, even though he has no unusual executive ability, plays a very important part in such a bureau. On the other hand, the outstanding qualifications necessary for the registrar of a state, pioneering in the operation of a vital statistics law, are organizing ability and legal knowledge. If those of our members in the second group can be given inspiration by the results obtained with the records analyzed and studied by the first group, the activities of our section meetings will have an added attraction. In addition to bringing the members of the second group back to the meetings each year, it will stimulate study and intelligent reading, and thereby raise the standards.

A sympathetic understanding of the problems and difficulties surrounding the collection of records is needed if we expect to have a section strong enough to include the interest and enthusiasm of all. Those who have worked in old, established bureaus where law and order hold sway and the doctors and undertakers accept the law as obligatory, know very little about the problems of a pioneer bureau where public sentiment has first to be created before anything like full appreciation of the mandatory elements in the law can be obtained. No one would think of questioning the advisability or value of studying and analyzing to the nth degree, provided the data are complete enough to be representative and the money expended does not unjustly rob the machinery necessary to produce complete records. However, the registrar in a bureau where funds are limited, may become so interested in statistical methods that his machinery weakens, thus causing an irreparable gap in the records with which he is entrusted. On the other hand, there is, of course, the danger of putting all one's time and effort into the collection of records and not polishing the rough diamond which has been mined.

During the past 18 years, I have traveled in practically every county of two states and from personal observations have found conditions that would astonish those who have confined their activities to

thickly populated areas where registration has been going on for many years. The importance of a birth certificate or a death certificate is not appreciated in many localities. In the Vital Statistics Section, we have spent considerable time worrying over what and how much shall be included in these certificates. This is important, but there are many districts where just the securing of a birth or a death certificate challenges the best efforts of a worker. There are still many places where living conditions are such that there is neither a doctor nor an undertaker.

Why worry about the International Classification of Causes of Death when the only information obtainable is that the deceased died from "misery in the stomach"? How can a birth certificate be secured if there is no doctor and the father considers it an insult if you pry into his family affairs by asking questions about his baby? A rare condition affecting the records in Florida last year was caused by the West Indian hurricane. It was not possible in many cases to identify the deceased; in fact, it was not even possible to classify by color, age or sex. Many bodies were not recovered; a great many bodies were cremated in the storm area; and in one instance, 527 bodies were transported in boxes for interment trench-wise. With limited help, flood conditions, decomposition, etc., even a count could not be expected that would represent the loss of life.

Putting a law on the statute books does not necessarily mean that the records provided for in that law will come tumbling into the bureau. On many occasions, I have been met with some such question as this: "It's the law, isn't it?" it being assumed that just because it is a law, 100 per cent of the records should be in the vault. As a matter of fact, the securing of complete records is a man-size job in many bureaus. There are several other laws known to most of us that are not 100 per cent enforced. Law enforcement in connection with the collection of records stands out as one of the important factors in rating efficiency. Our policy has been to make the court a last resort. First investigate all violations of law very thoroughly; give the other fellow the benefit of the doubt in every case; be lenient with those who are ignorant of the law and firm with those who are wilful violators. Study law enforcement in different localities; be firm but sympathetic in the enforcement of the law; and familiarize yourself with living conditions. Where ignorance is the cause of the violation, an educational campaign in that particular district teaching the importance, necessity and usefulness of records, will bring much better results than a hasty prosecution.

The average registrar looks with wonder at the results attained by

the highly trained statistician in much the same attitude that we all look on the radio and airship. Results are often understood by those who are not trained in the method of procedure. Many expert operators of cars are very poor mechanics and in many cases a very efficient mechanic may prove to be a mediocre operator. The statistician should be as familiar as possible with the problems confronting the registrar and his difficulties in securing the necessary records and the registrar should be encouraged and urged to use every available moment in well planned study and work to enlarge his knowledge of scientific methods.

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## Georgia's Surgical Pioneers

HEALTH Commissioner Wynne adds to its usefulness and extends the interest of his departmental bulletin by incorporating in it brief historical records of, and philosophical reflections on, the art of healing and preventing disease. Recently these included remarks on priority in the use of sulphuric ether to produce anesthesia. These remarks brought from Lamartine G. Hardman, who takes as much pride in his record as a physician and surgeon as he does in the fact that he is Governor of Georgia, a letter of surgical reminiscence which will appeal to the layman as well as to members of his profession.

Governor Hardman recalls the notable Crawford W. Long's pioneer use of sulphuric ether in an operation on James Venable on March 30, 1842, in Jefferson, Jackson County, Georgia. Governor Hardman was largely instrumental in putting up the monument to Long which marks that historic town. On Blackwells Island in 1877 he saw the first demonstration of Sir Joseph Lister's spray utilizing carbolic acid as an antiseptic in operations and for wounds. Sir Joseph's discovery of the potentialities of carbolic acid in control of gangrene is commonly fixed as of 1867. Governor Hardman writes that five years before this, in 1862, Dr. L. A. Dugas of Augusta, Georgia, during the war between the States, used it in the City Hospital where gangrene was prevalent. Dr. Dugas obtained the carbolic acid or the tar water from the pine tar, applying it in all these infections and wounds, and prevented the spread of gangrene. As a student of medicine, Hardman was taught by Dugas in Augusta Medical College. He declares that Dugas "is really the father of antiseptic surgery"; that he was the first to suggest laparotomy for gunshot wounds in the abdomen; and the first to use animal ligature—catgut—in the closing of wounds in the intestines, which he did in Wilkes County, Georgia, in 1856 or 1857. This catgut was a violin string taken from a fiddle at a party; the patient recovered. This incident is not mentioned in the biography of Dugas in *Appleton's Cyclopædia*. As a loyal Georgian, Governor Hardman says that he "suggests these thoughts that America, and especially Georgia, might be placed where they belong in their contribution to the relief and prevention of human suffering." In medicine and in surgery, as in other arts and sciences, establishment of precedence is sometimes difficult; the Doctor-Governor of Georgia is not dissuaded by difficulties from any essay at what he considers proper allotment of credit.—*The Sun*, New York, N. Y., Dec. 7, 1929.

# Responsibility of the Public Health Nurse for Social Phases of Her Work\*

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THE primary objective of public health nurses has evolved during the last 25 years from one concerned mainly with giving care to the sick poor, to that—commonly accepted today—concerned with attaining a maximum of health for all members of each family in the community.

Each year as science opens new ways of removing obstacles from the path of this objective it reconfirms the knowledge that health cannot be secured by caring for physical needs only, but is the result of many factors; that individuals cannot be viewed as entities unaffected by their environments; that physical health and mental attitudes have a direct relationship; that to treat effect intelligently one must search for the underlying cause, often obscure and elusive. Each year brings us to more forceful recognition of the close relationship between the so-called social and health problems of a family, and of the necessity of adjustment of the one if we would better the other.

As the public health nurse works in homes with families she further observes that these social problems which she uncovers fall mainly into two groups—minor maladjustments which if left uncared for may develop into serious social and health problems later; and acute major problems of an easily recognized pathological nature, often the result of lack of proper treatment in the past. The handling of these two groups differs, one calling for preventive, and the other for curative treatment. To facilitate clearer thinking, let us discuss each separately.

## RELATION OF MINOR SOCIAL MALADJUSTMENTS TO THE WORK OF THE PUBLIC HEALTH NURSE

Almost every family, if studied, will be found to harbor problems of minor social maladjustment, many of which with time and under-

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\* Read before the Public Health Nursing Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 4, 1929.

standing will right themselves. Others, if left untreated, may develop with the years into acute social ills—such problems, for example, as arise out of wrong attitudes between husband and wife, parent and child, or the child and his playmates. The presence of a person with mental deficiency or mental disease in a family that does not understand the difficulty or know how to handle it may completely wreck that family's chance to attain normal health and a happy life. Bad housing, poor housekeeping, unwise expenditure of an adequate budget, are barriers that keep many a public health nurse from realizing her "primary objective" in countless families.

The father who is ill with tuberculosis will not quickly show much permanent improvement so long as he is deeply worried over family finances, nor can the public health nurse easily safeguard children whose tuberculous parent insists on returning home from the sanatorium for frequent and lengthy visits because he is lonesome. She is learning that it is a much more difficult task to give adequate prenatal supervision to the mother who is unhappy over the expected arrival of the new baby, than to the mother who is joyfully anticipating him, and that she has but begun to understand the significance of the relationship between mental attitudes and physical health during pregnancy. She sees that child hygiene is becoming more and more linked up with parental education; that, for example, wrong feeding habits of children are often corrected only after the mother gains a clearer understanding of her unconscious motives in pampering her child. Again, the underlying reasons and attitudes that result in the uncoöperative patient must be unearthed and understood before much of constructive good can be accomplished with him.

Because of this shift of emphasis in her program and her appreciation of the added responsibilities, the public health nurse has come to change her attitude toward these minor, or incipient, social and mental problems. She has always had these before her, but where formerly she felt that she could not give attention to them because they would take time from an already overloaded program, she now sees that it is impossible to do good health work until they are dealt with, and so, far from jeopardizing her primary objective, such adjustment has become a step toward its attainment.

With this change in point of view, and the increasing demands from the field, it is not strange that nursing education is having to change in an effort to fit the nurse better for the task which confronts her. A beginning is being attempted with student nurses in some of the schools of nursing, who are being taught through use of the case study method to care for their patients, not as isolated cases but as

individuals, part of family and community life, whose illnesses bear directly upon those groups and their adjustments to them. They are being taught that it is impossible to do good constructive health work unless at the same time they see and understand the many social implications of their patients' problems.

Postgraduate courses in public health nursing are requiring their students to take many courses that help to give this broader outlook—psychology, sociology, mental hygiene, methods of family case work, methods of teaching. Never for one moment do we think of turning our public health nurses into "social workers," but we do hope for the nurse with the quickened social conscience, the nurse who sees the full implications of the social and mental phases of her health work.

To meet the needs of the older nurses already in the field, organizations are arranging staff education programs which are constantly widening in scope. A few forward-looking agencies, realizing the need for extensive study of this whole problem, are employing trained mental hygiene workers experienced in case work methods as supervisory consultants to their field nurses, in an effort to see just how much the application of mental hygiene and case work principles will help the average public health nurse to handle her family situations more wisely.

Although these experiments are really just well under way, a good beginning has been made toward the development in the nurses of better attitudes, and easier approaches to the day's work, attempting to increase their understanding and intelligent sympathy, to strengthen their sense of relative values, and to refine their technics in working with families. Study of the work now being done will undoubtedly do much to shape future policies, and should create a most promising field for the specially trained mental hygiene case worker who likes to teach and to accomplish results in her families by working through the staff nurse.

#### RELATION OF MAJOR SOCIAL PROBLEMS TO THE PROGRAM OF THE PUBLIC HEALTH NURSE

In the course of her work, the public health nurse also meets many problems involving social maladjustments of individuals in her families of such an obviously acute nature as to leave no doubt that the need is for immediate, skilled treatment—the sudden decrease of family income through death or illness, the neglect or mistreatment of children, the need for boarding home care, the problems of illegitimacy, improper guardianship, delinquency, and so on. There can be



no question that it is the responsibility of the public health nurse to sense and evaluate these problems in the homes that she comes into contact with, recognizing that here the question of proper treatment is often closely tied up with that larger one of community resources.

What is the financial rating of the community? Can it provide specialized, trained workers to handle these acute problems? Does it provide them? If it does, then so far as the public health nurse is concerned, the matter is best resolved into one of securing increasingly better coöperation with the social agencies—coöperation which is built on mutual understanding, faith, good will, and a common desire to give the community the best quality of service possible. One public health nursing agency has found that the addition of a mental hygiene case work supervisor to the staff has done much to help the field nurse in referring these problems more intelligently, giving her a better understanding of the social worker's point of view and the difficulties under which she works, as well as a more specific knowledge of what she can fairly be expected to accomplish in a given time.

If no such workers are supported by the community at the time, is it due to financial inability or to ignorance? If the latter, again the public health nurse has an opportunity for public education, working through her board of directors and nursing committees. Countless communities throughout the United States owe the provision for increased social work facilities to the determination and leadership of public health nursing groups and lay groups spurred on by nurses of vision.

There are many rural areas that for years to come cannot afford more than one community worker—cut over timber lands that have to await the growth of new forests for return of prosperity; agricultural sections where banks have failed until almost none are left; regions where the total resources are too poor to support even the most meager of public schools without much federal aid. The health needs of these rural people are often more readily recognized by themselves than their social or mental ones, and the work of the public health nurse carries an appeal—through her service to children—that is often the first to be met. No matter what the need for trained social workers, it has to be admitted that probably in many of these communities they will not be employed out of local funds for several generations to come.

What is the public health nurse to do with these acute social problems?—leave them alone? Some do, and that this is entirely unsatisfactory from a community point of view is too obvious to need comment. Shall she try to solve them herself, adding them to an already

greatly overcrowded program? If she does, one of several things will happen: She may choose to work longer hours than any one human being should, and finally lose courage and leave. She may drop part of her health program to make way for these other very difficult duties, with the result that both health and social programs are poor in quality, but the best that she can give unaided. Some sections have tried this method as a state-wide policy, and after several years of observation have been forced to admit that from a public health nursing angle, at least, it has been unsuccessful—the quality of the health work accomplished has been so poor.

The public health nurse may train a group of lay people to study seriously these community and family needs, handling each problem as it arises as an individual community challenge. The first two methods have not been satisfactory from the community's point of view; this last is still so experimental that little definite advice can be given as how best to train such groups. Certainly the public health nurse needs help here, and we look for the time when travelling field advisers, perhaps mental hygiene workers trained in case work, will be supplied to the rural nurse by such agencies as bureaus of public health nursing of state boards of health, or the American Red Cross, to help in the training of these groups, and to give advice to her on the disposition of her concrete social problems. The whole question, as it relates to these poor rural areas, is one that needs much experimentation, scientifically done, honestly analyzed.

A few agencies, believing that they obtain a better quality of family and community service through use of the combination worker, are advocating the nurse-social worker, who carries all the social and health work done by the organization in her families, much as is being practiced in certain parts of Europe. One notable exponent of this is the New York Association for Improving the Condition of the Poor; but even here need is felt for more experimentation with certain phases of the work, before this organization is willing to recommend the practice unreservedly to others.

From them we hope in time for the answer to some of these questions:

What shall the family case load be for such field workers—smaller, of course, than that of either nurse or social worker who handles but a single phase of the family problems—but how small as a maximum?

What factors must enter into the determination of size of case load?

How shall such combination workers be trained, and where, so that they will be able to practice not only treatment but prevention?

What form shall staff education take to this end? How shall supervision be given, and by whom—an expert in each field, or a combination worker of long experience and complete education?

Is the nurse-social worker more or less expensive to the community, realizing the many factors—of education, supervision, and administration—which must be considered?

What are the concrete, specifically proven advantages to the family and the community of this type of worker over the other two specialists?

Even in such an organization as the A. I. C. P., we find certain phases of both social and health work done by specialists, so that the field workers are not carrying on completely generalized organization programs in all families. Why?

There is one last phase of the subject which will bear brief mention. That is the responsibility which the public health nurse is having thrust upon her in families that are economically self directing. In every community there are many such families who, when trouble comes, rarely think of turning to a specialized social agency for advice and help; but to them the friendly public health nurse has daily access, and to her sympathetic ears are recounted troubles of all sorts and sizes. She feels her obligation to advise as wisely as she can, calling for the assistance of specialists when they are available or necessary—but for years to come it is safe to prophesy that she will be the guide sought more and more by self directing, economically independent families, whose maladjustments and needs are often as acute as those found in the poorest tenement flat.

In conclusion, we can but repeat that this question—how the public health nurse handles the social phases of her health work—needs such careful study as to make experiments with it watched with keen interest by both nurse and social worker, here and abroad. It behooves us individually and as a profession to keep open minds, and to give every encouragement to groups who courageously step away from tradition to try out new methods, to develop new points of view. Let us only make sure, first, that our experiments are scientific in procedure, for opinions based on opinion only without substantiating scientifically collected facts are of too uncertain value to be of much use in guiding programs of work; and, most important of all, let us take care that in our zeal for research we do not forget that primary purpose to which all public health nursing is committed—giving increasingly better health service to families.

# How To Tell What\*

## In Popular Health Instruction

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THIS title may sound like a barbarism, but there is reason behind it. For several years our section, particularly in its clinics, has devoted much time and effort to the consideration of the content of health education material. Basic rules have been formulated and presented as guides to the selection and evaluation of the data, which might profitably be incorporated in our educational program. Scientific accuracy, soundness of basic fact, appropriateness, pertinence, and the like have been stressed as the *sine qua non* of the material out of which our educational instruments must be fashioned. In direct presentation and through critical self testing we have listed, tried, and affirmed these norms. We have thus thoroughly considered the *content* of the "What" of health education.

These considerations constitute but the first principles in our complicated metier. That sound construction implies good building material, is a valid principle, but it neither defines the technic of construction, nor yet foreshadows the pattern of the ultimate product. It is this part of our problem that we designate by the "How" of our title. It is our aim in this paper to start where we left off a year ago, and advance to the consideration of a few basic principles in the technic of our art. I say "our art," because, as Routzahn stoutly insists, health education deals with science, but is not in itself a science. It is predominatingly an art, and art is that elusive something which does not lend itself to complete definition, nor can its essence be reduced to principles. Most of us can attest to this fact out of our own experiences. When confronted with a piece of health education material and asked for our judgment, we are like the amateur art critic who begins his critical remarks by the affirmation, "I know little about art, but I know what I like." An effort has been made to reduce this "knowing what we like" to principles.

In all, there seem to be but four cardinal principles to the technic of health education. The technic of a good salesman, when analyzed,

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resolves itself into four steps: first, he arouses curiosity, then enlists sympathy, gives information, and lastly, by a masterful stroke puts across his sales. These are also the four cardinal principles in the health attraction technic.

Health education material should first and foremost arouse curiosity. Living human beings are bodies in constant motion, following a course determined by antecedent propelling forces. If it is our desire to change the course of human movement to a new direction—toward health consciousness—in conformity with the well known principles formulated long ago by Newton, we must apply a new force to the body in such a way that the resultant of the initial and new force will deflect the moving body toward the desired end. For this there is no more effective agent at our command than curiosity. No thing so readily takes a man off his appointed task, or out of his determined path as curiosity. Watch a man as he walks the street, or a child as it plays. Seldom is the path as straight as the proverbial arrow, rather it zigzags, the point of deflection corresponding usually to where the stimulus, the force of curiosity, has produced a new resultant direction.

Our first step must therefore be to arouse curiosity, to force, if you please, a consciousness of our presence upon the selected subject. But—and this is the second principle—having aroused curiosity, and thereby having secured attention, we must now retain it. To achieve this we must enlist sympathy. A man may be walking, thinking of his stocks or bonds; he becomes aware of the beating of a drum; he turns his head in the direction of the sound and perceives a heretofore unnoticed crowd. His curiosity is aroused; he draws near and finds a revival meeting going on. Whether he remains to listen to the exhortations or goes on his way will depend on a variety of conditions, but in no small measure on whether his sympathy has been enlisted. Curiosity attracts, sympathy holds, and it would profit us to comply with these first two principles in the construction of our health education material.

Assuming we have achieved both; assuming that we have aroused curiosity and enlisted sympathy; what then? These first two steps are but means to ends. What are the ends? The ends of health education are instruction, and action. The third and fourth principles in our health education technic are, therefore, to impart information and to lead to action. These need no elaboration, they are self-evident; hence, we may recapitulate and say that four cardinal principles in health education technic are: (1) to arouse curiosity; (2) to enlist sympathy; (3) to impart information; and (4) to lead to action.

Having enumerated these principles we must consider in a more concrete manner how they may be applied. We must ask and find an answer on how to arouse curiosity, on how to enlist sympathy, as well as on how to impart information and lead to action. The first two of these we will consider in greater detail than the last, partly because they lend themselves to more ready generalization, and partly because they have been less commonly dwelt upon.

How is curiosity aroused? The answer is simple—by the extraordinary, by the novel, by the new. A man standing silently and operating a little machine into which at one end are fed slips of white paper that emerge from the other as dollar bills is a novel sight. He therefore attracts attention. An old proverb given a new twist is novel, and will attract attention. New color combinations, odd patterns, novel forms; these and like agents can be used to arouse curiosity, to attract attention. But, in arousing curiosity, one must not confuse the extraordinary with the sensational, nor the novel with the bizarre. Arousing curiosity is not an end in itself—carried to an extreme it tends to defeat the end which it should serve.

Having aroused curiosity it is our aim to retain attention, and this means enlisting sympathy. How is this to be achieved? The answer is to be found in the vital egocentricity of man. Under each and every circumstance man tends to interpret his environment, and everything new confronting him, in terms of himself and his own. Consciously or otherwise he asks of everything, does this concern me and mine, and if so, how? If it does concern him he is either sympathetic or antipathetic. If it does not concern him he is indifferent, his consciousness moves on to newer fields. If, therefore, we aim to enlist the sympathy of the person whose attention we have secured we must anticipate his question, "does this concern me?" and answer it convincingly in the affirmative.

Having achieved the foregoing we are in an advantageous position to secure the ends of health education, namely to impart information, and to lead to action. The former comprises a field intricate and extensive, and it is not vital to our consideration, or possible now to enter into it in a detailed manner. Its own technics are so multiform and so dependent on the nature of the information to be imparted and the conditions of those addressed, that even to attempt to consider them here would lead us far afield. Only this needs to be noted—that the novel and sympathetic manner of presenting facts will tend to make them more welcome and more appreciated. Our first two cardinal principles integrate with the third.

Finally, there remains to be considered the "How" of leading to

action. The key to this problem is the appeal to the emotions. We may instruct and convince by an appeal to the intellect, but the emotions seem the fountain source of action. Desire is primarily an emotion which, I grant you, most of us as thinking beings tend to rationalize. To achieve an action we must make the end desirable, which means we must emotionalize it, preferably with a pleasurable emotion, though sometimes of necessity with a painful one.

Commercial advertisers have appreciated these various items in the technic of education, and though we may not agree with their ends, we can profit by their methods. Witness for example how the advertiser attempts to sell his five-foot shelf of books. Does he content himself with a mere intellectual appeal on the value of culture? No, he emotionalizes his appeal by promising the purchaser of his commodity popularity with the fair sex, and a spellbinding faculty with the men.

The four cardinal principles in health education technic which we have listed might at first appear like so many water-tight compartments definitely separated from each other. It may be convenient for the purpose of exposition to present them in this fashion, but actually they are not so separate; on the contrary, they tend to integrate and fuse. That which arouses curiosity may at one and the same time enlist sympathy, or even instruction. For our technologic purposes, however, and for checking on our material it is worth our while to test our educational instruments for each of these desired qualities. Thus, when our preliminary work has been done and we have gathered together the material, the "What" of our health education, then it is up to us to attempt its organization in the manner outlined. The substance should be so manipulated that it will arouse curiosity, enlist interest, impart information and lead to action.

Needless to say it is not always possible to accomplish all of these four objectives in every piece of health education material. A poster for example may only arouse curiosity; a piece of literature may do the same, and in addition enlist sympathy, but if the individual piece may not achieve all four objectives certainly the totality of our program or campaign should accomplish this.

# Pasteurized Dried Fruits\*

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IN this paper it is desired merely to discuss briefly certain public health aspects of dried fruits. Tremendous quantities of dried fruits, such as raisins, dates, figs, prunes, peaches, apricots, and apples, are produced either in this country or are imported. They are liberally eaten and relished by people in every walk of life.

The basic principle of drying is the reduction of moisture to a point where microorganisms are unable to proliferate and cause spoilage. For most dried fruits, this moisture content critical point varies from 20 to 30 per cent according to the amount of soluble solids present in the fruit. Naturally the higher the concentration of sugar, the greater the moisture content that can be tolerated without spoilage.

Drying is carried on both by evaporation in the sun and dehydration in stack, kiln, or forced draught tunnels. The latter method is becoming more and more popular and actually produces higher yields of superior quality dried fruits. Rain damage, insect infestation, and spoilage are largely precluded when fruits are dehydrated.

In sun drying, the temperature of the fruit seldom exceeds 120° F. Dehydrated fruits reach temperatures of 160° to 180° F. To avoid case hardening, absolutely dry air is not used for dehydration, but rather air containing 20 to 40 per cent relative humidity. Dehydration processes ordinarily require from 8 to 36 hours for completion. Lye dipping for a few seconds to check the skins and hasten the evaporation of water is usually practiced. Sulphuring, that is, exposure of the fruit to fumes of sulphur dioxide to prevent discoloration, is also generally employed on apples, pears, peaches, apricots, and some kinds of grapes and figs. Normally, prunes are not sulphured. The sulphuring also protects the fruit against spoilage and, according to recent researches, serves also to conserve vitamin C.

Dried fruits are sold both in bulk and packed in retail sealed paper cartons or tins. The use of the sealed paper carton or tin for merchandizing dried fruit is growing rapidly. From a public health point of view sealed packages are to be preferred to open bulk containers.

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## MICROÖRGANISMS ON DRIED FRUITS

Very limited studies have been reported. Prescott,<sup>1,2,3</sup> working largely with artificially dehydrated vegetables, found a varied microbial flora on dried peaches, tomatoes, bananas and vegetables. The numbers of bacteria varied from less than 100 to over 1,000,000 per gm., with an average of less than 10,000. The types were similar to those found on fresh fruits or in soil and water. Both spore and non-spore formers were isolated. No pathogens or toxicogenic bacteria were found. Saprophytic molds were nearly always present, usually as spores which evidently had survived all pretreatment and dehydration. He found that the numbers of microörganisms on dried foods gradually decreased during storage, providing the moisture content remained approximately constant. Several laboratory and plant tests using fresh vegetables and fruits artificially inoculated with *B. coli*, *B. paratyphosus* A and B, *B. enteritidis*, *B. suispestifer*, *B. typhosus*, *Cl. botulinum*, *Micrococcus pyogenes aureus* and *B. subtilis*, were made with "very reassuring" results. Although no typical pathogen was recovered from the vegetables or fruits after thorough dehydration, the data presented are rather vague and inconclusive.

Nichols<sup>4</sup> found no sample of dried fruit sterile, but many had only a few bacteria and molds. No pathogens were found. He calls attention to the possibility of contamination between the dryer and the consumer. Though too dry to grow, bacteria may not immediately die but remain dormant until more favorable conditions of moisture and temperature arrive.

Hunwicke and Grinling,<sup>5</sup> in England, traced an outbreak of severe colitis to French packaged dates. The causative organism is called *B. coli tropicalis*, the description practically paralleling that of *Escherichia coli*. Eleven samples of French and English packaged and bulk dates were examined bacteriologically with the result that intestinal coliform organisms were isolated from six. Strangely enough, none of the bulk date samples showed any intestinal bacteria. It was concluded that dates may readily be contaminated during the repacking process, and that the presence of coliform organisms on the surface of packed dates constitutes a serious public health problem.

## EXPERIMENTAL WORK

Inasmuch as the findings of Hunwicke and Grinling in England demonstrated the possibility of disease transmission by dried fruits, certain bacteriological examinations were made in our laboratory of the dried fruits found in American markets. No active spoilage was noted in any sample.

Standard laboratory methods of the American Public Health Association were used. Ten-gram samples of the fruits were placed in 90 c.c. of distilled water in rectangular, rubber-stoppered dilution bottles, shaken, allowed to stand 1 hour, then violently agitated for 2 minutes. Nutrient agar plates incubated at 30° C. for 72 hours were used. Due to overgrowths of molds in some cases, mold counts were made after 48 hours. Some of the data are given in Table I.

TABLE I

MICROÖRGANISMS IN AMERICAN DRIED FRUITS AS PURCHASED

Description of dried fruit	No. of samples	Average moisture content	Bacteria per gm.	Molds per gm.	Yeasts per gm.	No. of samples contg. lactose fermenters
Dates, Iraq bulk.....	8	16.1	12,300	18,400	20	3
Dates, Iraq packaged.....	12	17.1	3,970	35,800	55	2
Dates, Iraq commercially pasturized ..	16	19.4	80	700	0	0
Dates, Iraq laboratory pasteurized ..	8	20.6	65	160	0	0
Dates, Calif. packaged.....	2	15.6	760	700	100	0
Dates, Calif. glass packed.....	2	44.0	320	0	0	0
Dates, French Algerian packaged....	1	24.0	18,000	42,000	16,000	1
Figs, Smyrna packaged.....	2	9.6	420	20	3	0
Figs, Calif. packaged.....	2	15.1	210	200	10	0
Figs, Smyrna lab. pasteurized.....	2	19.8	20	10	0	0
Prunes, bulk.....	2	15.0	25	15	0	0
Prunes, packaged.....	2	16.3	15	6	0	1
Prunes, lab. pasteurized.....	1	20.6	0	2	0	0
Peaches, bulk sulphured.....	1	13.3	10	0	0	0
Peaches, packaged sulphured.....	1	15.1	6	0	0	0
Raisins, seedless.....	6	15.3	310	340	6	1
Raisins, seeded.....	2	17.1	40	90	0	0
Currants (grapes), packaged.....	2	17.3	95	105	0	0
Apricots, bulk sulphured.....	2	11.8	8	17	0	0
Apricots, packaged sulphured.....	2	13.9	20	0	0	0
Apples, bulk sulphured.....	2	21.9	40	10	10	0
Cranberries, packaged.....	1	6.0	0	3	0	0

Variations in numbers of microörganisms on dried fruits are very great. It is necessary to use the results obtained from several samples if reliance is to be placed on the data. The method of averaging counts as in Table I is subject to criticism. Some samples have no bacteria while others may have 100,000. Obviously it is not exactly fair to call the average count 50,000. Since it is impossible to print individual counts the method of averages is used.

The counts on raw dates are highest of any of the fruits, while sulphured fruits are lowest. Without doubt the length of storage largely determines the numbers of organisms present as Prescott and his coworkers<sup>2</sup> have demonstrated. It is therefore probable that

some of the samples examined harbored many more organisms after packing than the examination showed. On the other hand bulk dried fruits may readily pick up organisms by improper handling and storage. Of the 79 samples of dried fruits examined only 8 contained lactose fermenting bacteria. None was identified as *Escherichia coli* though several closely resembled *Acrobacter acrogenes*.

It is surprising that yeasts were not encountered more often. Sixty of the samples showed no yeasts—at least none developed on the nutrient agar used as a medium. This is contrary to the belief that yeasts are abundant on dried fruits. Anaerobes were present in somewhat over half of the samples but always in small numbers. Cocci, especially Sarcinae and Micrococci, were relatively abundant and second in numbers only to the spore-formers. The molds were all common saprophytes. *Aspergillus* was most numerous, with *Penicillium* second, and *Mucor* third. In many samples molds outnumbered the bacteria. The spores of the *Aspergilli* were relatively heat resistant. Some usually survived the pasteurization processes which destroyed all microbial vegetative forms and greatly reduced the number of bacterial spores.

Bulk dried fruits harbored more microorganisms than packaged. There is a strong tendency in the trade toward the package as opposed to bulk goods. The packers are simply catering to the public demand for a clean, wholesome, uniform product.

#### PASTEURIZATION

Preliminary experiments with dates, figs, raisins and prunes have demonstrated that these fruits may be heated to pasteurization temperatures without injuring their texture or flavor. The total numbers of organisms were greatly reduced. In the case of dates the average reduction varied from 93 to 99 + per cent; prunes and seedless raisins gave similar results; but figs were much more difficult to handle and gave somewhat inconsistent results.

In the case of dates, huge commercial continuous pasteurizers are now in use which handle several thousand cases daily. The process is varied for each type and variety of date but the results have been very encouraging and the process is effective not only in destroying a large percentage of the microorganisms present and thus insuring a safe food, but the appearance, texture and flavor are actually improved. The dates are treated in the retail paper carton and are not handled after the heat treatment.

Numerous laboratory experiments showed that temperatures of from 160 to 185° F. in the fruit at humidities of 70–100 held for from

30 to 90 minutes were effective for the different dried fruits. A usual preliminary or coming-up time of 10–30 minutes is necessary in addition. The moisture content of the original fruit, its size and texture affect the efficiency of the pasteurizing process. It is necessary to work out the individual and combined effects of these variables for the different fruits, and even varieties and grades of the same fruit. There is a slight increase in moisture content of all fruits treated by this method, varying from 1 to 5 per cent, depending upon the original moisture content as well as humidity. Forrest<sup>5</sup> has been granted a patent on a process designed to recondition prunes and figs which have dried out and sugared. He uses temperatures somewhat below 212° F. for varying exposures. We found that lower temperatures are efficient in pasteurizing the more acid fruits, because of their lower pH. For example, peaches, apricots and prunes can be treated at lower temperatures than figs or dates.

#### INOCULATION EXPERIMENTS

Only laboratory tests have been made. Dates, figs, raisins and prunes were coated with cultures (2 sources) of *Escherichia coli* and subjected to various pasteurization treatments. In all cases where the relative humidity was 75 per cent or more, a 30 minute-exposure to 160° F. was sufficient to destroy all the organisms. Approximately 40 of these tests were made. Using *Eberthella typhosum* on dates, a single experiment showed complete destruction of the organisms after exposure to 170° F. for 25 minutes, or 160° F. for 30 minutes, at a high (unmeasured) humidity. Since the colon bacillus is considered more resistant than the typhoid, the above findings are significant. In conducting heat treatment experiments care must be taken to keep up good air circulation, otherwise considerable variations in temperature occur in different parts of the pasteurizer. Wet steam forced into the air chamber by means of fine spray nozzles and thoroughly mixed by the use of electric fans, was the method of regulating humidity. Humidity was calculated by means of recording thermometers, giving both dry- and wet-bulb readings.

#### STORAGE TESTS

A few storage tests were conducted wherein cartons of dates, prunes, raisins and figs were liberally inoculated with *Escherichia coli* and stored at laboratory temperatures until the organisms had died out. Though the results were variable the colon bacillus always died out on prunes in 15 days; and on raisins, dates and figs in 30 days. Prescott, Nichols and Powers<sup>7</sup> had previously pointed out that the

bacterial count in dried vegetables gradually decreases during storage, providing the moisture is under 10 per cent. Molds remain more nearly constant. There is no doubt that the bacterial and yeast counts of dried fruits which have undergone long storage will be low.

#### CONTROL OF DEHYDRATED FOODS

Prescott<sup>7</sup> and the *U. S. Army Quartermaster Regulations* sum up the situation as follows:

After dehydration, fruits and vegetables should be packed at once in suitable tight receptacles or stored in bins which have been specially prepared and which have adequate protection against vermin, insects, molds and other microbic enemies. Such storage receptacles or containers should prevent access of moisture in sufficient amounts to render the food material capable of fermentation or decomposition. The methods of handling the finished product in the factory should be such as to preclude infection of any sort. Care should be taken to impress upon the manufacturer that he is dealing with a food material and that it is essential to the welfare of the consuming public that such food materials should be placed before the consumer in a wholesome and uninfected condition.

Since many of our dried fruits are not dehydrated but merely sun dried, and all are often handled or exposed to infection during repacking or storage, in addition to the above recommendations, at least in the case of some dried fruits, a final heat treatment or pasteurization in the carton should greatly aid in insuring a safe and satisfactory product.

#### SUMMARY

Dried fruits harbor considerable numbers of molds and bacteria and also a few yeasts. It is desirable to protect the public against bacterial infection from these foods. At least one such outbreak has been reported.

Dried fruits such as dates, raisins, figs, apricots and prunes may be pasteurized in paper cartons with moist heat at controlled temperatures and humidities. In general, different treatments are required for each fruit and often each variety must be handled a little differently. Temperatures which have been found effective in greatly reducing the total numbers of microorganisms on dried fruits at humidities of 70–100 per cent vary from 150° to 185° F. for 30 to 70 minutes. *Escherichia coli* and *Eberthella typhosum* were destroyed in every case where the temperature of the fruit remained at 160° F. or above for 30 minutes at relative humidities of 75 per cent or more.

Commercial processes for the effective pasteurization of dates, figs and raisins are now being developed or used.

Sulphured fruits harbor very few organisms because of the inimical

effect of the sulphur dioxide. Acid fruits are more easily pasteurized than those of higher pH.

From a public health viewpoint, pasteurization marks a definite advance in the merchandising of dried fruits.

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## National Better Business Bureau

THE National Better Business Bureau, with headquarters in New York, and the various affiliated Better Business Bureaus scattered over the country have for some time been doing excellent educational work in giving editors and publishers the facts regarding schemes that are operated to the detriment of the public. Naturally, the medical field comes in for its share. Physicians may be interested in knowing that not a day passes but the Bureau of Investigation of the American Medical Association receives requests either from the National Better Business Bureau or from some of the affiliated Better Business Bureaus asking for information on certain medical schemes that seem open to suspicion. More than 600 such letters have been received and answered so far this year.

The Better Business Bureaus are primarily interested in "Truth in Advertising." Knowing that every false, misleading or fraudulent advertisement in any field tends eventually to break down public confidence in all advertising, the Better Business Bureaus—which are an outgrowth of the International Advertising Association, previously known as the Associated Advertising Clubs of the World—have been, and are, carrying on a campaign for truthful advertising that redounds not only to the credit of advertising in general but, in the medical field at least, also operates in the interest of public health.—*J. A. M. A.*, Nov. 9, 1929.

## EDITORIAL SECTION

*Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.*

### EDITORIAL COMMITTEE

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### THE USE OF IRRADIATED FOODS

NO subject has so occupied the attention of the medical world in recent years as Steenbock's discovery that exposure of food to ultra-violet rays imparts to it antirachitic properties. Following this discovery, further observations showed that the substance in food responsible for this remarkable effect is ergosterol, which although inert in itself becomes activated when irradiated. Just what change occurs in the ergosterol as a result of this exposure is still unknown.

The antirachitic potency of activated ergosterol (the antirachitic vitamin) is tremendous. Previous to its discovery, cod liver oil was the most concentrated source of the antirachitic vitamin known. Now it has been shown that 1 ounce of activated ergosterol has the same antirachitic effect as 2 to 6 tons of cod liver oil. It is evident that we have at our disposal in irradiated ergosterol a most potent therapeutic agent.

The mode of action of activated ergosterol in the body is not known. It is necessary, however, for the absorption and utilization of calcium and phosphorus from the gastrointestinal tract, for without activated ergosterol the lime salts are not absorbed and deposited in growing bones. In short, activated ergosterol makes substances already present in the food available for the body. There are probably other essential phases of the body metabolism which are dependent on the presence of this substance.

Rickets is a disease chiefly of the first 2 years of life. During this time milk is the most important article of food. The amount of activated ergosterol normally present in milk is so small, particularly during the winter months, that for all practical purposes it should be

regarded as being devoid of this necessary substance, which means that it is essential for every infant and child to receive some substance containing activated ergosterol at least during the winter months. The same holds true for the older child and adult.

It is essential for the physician to have some idea of the amount of activated ergosterol necessary for protection against rickets. From extensive clinical experience it has been found that 3 or 4 teaspoonfuls (about 15 gm.) of good cod liver oil daily is sufficient to protect an infant. The equivalent amount of ergosterol is about 0.2 mg., which is 2,000 times the amount necessary to protect a rat, or 2,000 rat units. It must be understood, however, that the potency of different samples of irradiated ergosterol may vary tremendously, and it is therefore impossible to use the weight of ergosterol as a unit of measurement.

Commercial firms are now beginning to market irradiated food. At present we have little idea as to their antirachitic potency. We may use an irradiated food in the belief that it has enough antirachitic effect to prevent rickets when in reality there is present only one-fifth or one-tenth the required amount. On the other hand we may be giving an overdose with resultant harmful effects. The solution of the difficulty lies in a statement by the manufacturer of the food in question as to the number of units of activated ergosterol present in a given amount. When we realize that 2,000 units is the average daily amount of the substance necessary to protect an infant, we can tell whether the particular irradiated food exerts only a slight antirachitic effect or may be used as the sole source of the vitamin.

The whole question of the use of irradiated foods must be approached with an open mind. It is not impossible that irradiated foods which produce only a slight antirachitic effect in infants, and none in the older child or adult, may still produce other beneficial effects of which we know nothing. The evidence at hand indicates that in irradiated foods we have a most valuable therapeutic agent. However, our practical knowledge of their effect on human beings is still so meager that one hesitates to predict just what place they will play in nutrition.

### SHOULD CERTIFIED MILK BE PASTEURIZED?

A STATEMENT in this JOURNAL, July, 1929, page 784, in which certified milk was excepted from the advice urging pasteurization of all market milk, has brought some protests and some inquiries to the Editor.

According to good authority, the most recent statistics show that



Since 1926, malaria has unquestionably been on the increase, for reasons which are not entirely clear. "During 1929, it is said to have become of importance in several areas hitherto considered malaria free."

The State Board of Health of Illinois in commenting upon the conditions in that state a short time ago attributed the increase to the use of the automobile. In the opinion of epidemiologists, medical men and engineers of the Office of Malaria Investigations of the U. S. Public Health Service, there has been no such radical change or increase in automobile travel as to account for the sudden rise in the malaria rate, and in some cases, as between Florida and the North, there has been a distinct decrease since the collapse of the boom in that state. Unquestionably there is greater opportunity for infection among those who camp out along the main routes of travel, and even those in the hotter sections who take evening drives, but there seems no justification for concluding that such travel, which has shown no radical changes in the last three or four years, can be responsible for the sudden increase in the prevalence of malaria.

There are other explanations, none of which seem to account for all of the facts. The spring of 1929 was unusually wet, and some believe that this led to a great increase in the numbers of anopheles. A possible change in the virulence of the malaria parasites has been suggested, while still others hold that unknown factors are responsible for the recrudescence of the disease. Certainly here is a field for careful epidemiological and laboratory work.

That it is possible to reduce the incidence of malaria to the vanishing point even in badly infected areas was shown during the World War in a number of camps in the South. We know the intermediate host and the method of transmission, factors which usually enable us to control a disease. However, the death rate from malaria is comparatively low, and the human factor, which is always the most difficult to deal with, comes into play. The late Dr. Carter, who knew as much about malaria as any man in the world, once said in this connection, that he knew what he could do by draining, ditching, oiling, and brushing, and with such materials as cement and timber, but he did not know what he could do with human beings.

If malaria were a more deadly disease, it can hardly be doubted that our control of it would be easier. On the other hand, it must be recognized that there are still factors which are not well understood, and over which, in consequence, we do not have much power.

## DR. FREDERICK MONTIZAMBERT

February 3, 1843 — January 2, 1930

THE long career of a distinguished public servant ended January. 2 in the death at Ottawa in his 87th year, of Frederick Montizambert, C.M.G., I.S.O., M.D., F.R.C.S.E., D.C.L.

For upward of half a century (1865-1920) previous to the formation of the Department of Health at Ottawa, the public health work of Canada was carried on almost single-handed by the Director-General. Under his direction the quarantine and Marine Hospital services and laboratories of both coasts and at Grosse Ile in the St. Lawrence were developed. The fine commanding figure of this courtly gentleman, towering head and shoulders above his fellows, has been conspicuous at the public health gatherings of North America since their earliest days. He had been president of both the American and Canadian Public Health Associations, and to his energy and ability much of the public health progress on this continent must be ascribed. Dr. Montizambert was elected to the Presidency of the A. P. H. A. at Charleston, S. C., December 19, 1890, and presided at the Nineteenth Annual Meeting in Kansas City in 1891. He was an Honorary Fellow of the Association.

The younger generation of public health men owe much to the fine public spirit, the wise counsel and the friendship of Dr. Montizambert. He is a notable example of the public servant seen all over the British Empire, whose greatest regard is commonly to be found, at the end of his career, in a sense of duty well done.

Present at the birth of the public work of Canada, Dr. Montizambert witnessed the ravages of typhus, of which he himself was a victim, and of cholera



among the early immigrants. He saw the evolution of the work of preventive medicine, from the mists of empiricism to the scientific atmosphere of the present; he observed the advance of curative medicine and surgery from a similar empiricism to their erection on a scientific basis. But what one best remembers are his kindly qualities, his genial smile, his fervent handgrasp, and his "God bless you, my dear boy!"

## LETTERS TO THE EDITOR

TO THE EDITOR:

Relative to a recent editorial in the December, 1929, issue of the JOURNAL entitled "X-Rays and the Public Health," the question is asked, "Will not some progressive health department install a radiologist and invite the practitioners of its constituency to send all their patients suspected of tuberculosis and all contacts of an active open phthisis for X-ray and expert interpretation, whenever the financial status makes it impossible for this aid to be privately obtained?"

I desire to record that the Los Angeles County Health Department has been engaged in just such a campaign since March, 1929. We have a full-time radiologist, who is an expert in chest diagnosis, with two full-time assistant technicians. The latest X-ray equipment is installed at several of our major health centers located in strategic points in the county. Free diagnostic consultations are offered to the medical profession in all cases unable to pay privately for such service, and whenever recommended by the family physician. A campaign among children of high school age was carried out during the months of April, May, and June. A total of 197 selected contact children and those underweight were X-rayed with the following results: 2 cases of pulmonary tuberculosis, adult type, were found, and 11 juvenile cases of tracheo-bronchial glands.

A special summer health school for contact children is maintained each summer, and 78 of these children were radiographed. Of these 78, 48 showed tracheal bronchial tuberculosis. Seven showed the adult type of the disease and 8 showed evidence of both. This work

has proved very popular with the medical profession and we expect to push the campaign vigorously during the coming year. Let it not, therefore, be said that this field of work is overlooked by all health departments in this country.

J. L. POMEROY, M.D.,

Los Angeles County Health Officer.  
December 19, 1929

TO THE EDITOR:

In October, 1927, I had the honour and pleasure of saying a few words about the German Hygiene Museum, Dresden, and its activities at the Annual Meeting of the American Public Health Association in Cincinnati, O. Since that time the Museum has constructed a new building for its educational purposes, and this new building will be opened in May, 1930. The exhibits to be shown there will make part of a great International Hygiene and Public Health Exhibition, which undoubtedly will be visited by everyone interested in both these matters present in Europe at the time of the Exhibition.

The idea of the first International Hygiene Exhibition, held in Dresden in 1911, and its initiator, Karl August Lingner, was to open new ways to health education which at that time was rather a new and little explored field. Since then, the Hygiene Museum tries to spread knowledge of the human body and its functions, about sicknesses and the methods of fighting them, about child hygiene and nutrition, etc., all over the world through greater or smaller exhibitions, and through furnishing educational material—almost to the

whole of Europe and even farther. The Exhibition of 1930, including the new displays of the Museum itself, is going to be as important as that of 1911 was, as many Americans, and especially readers of the *American Journal of Public Health*, will remember.

The different parts of it will be:

I. The scientific exhibit of the Museum itself in the new building.

(a) *The Man*—This exhibit has been remoulded totally for 1930. All that will be shown here in 1930—pictures, plastic models, movable models and arrangements to be worked by the public—will be new and quite different from the ancient routine work. Besides the "Transparent Man"—a special way of showing the parts of the human body like tissues under a microscope, of which I could also show some specimens in Cincinnati—another new method will make visible the character of the human body as a scientific and artistic masterpiece of nature.

(b) *Heredity and Eugenics* (Race Hygiene)—These are more modern branches of biology and hygiene, and the group, although shown already in 1911 in its first beginning, is almost totally a new thing.

(c) *Mother and Wife*—This group treats especially of woman's task in reproducing the human race, and of her preparations for this purpose. Her peculiarities as to this special accomplishment are shown, while her position in trade and profession is shown elsewhere in the exhibition.

(d) *Nutrition*—Anatomy of the digestive tract, metabolism, nutritional needs, including the economical problem, vitamins.

(e) *Health and Sickness*—Private and public prevention of disease.

(f) *Health Education*—Pictures, posters, pamphlets, lantern slides, moving pictures, theatre, etc.

(g) *History and Ethnography of Hygiene and Public Health*.

II. The scientific exhibits in the exhibition buildings besides the new Museum building.

(a) *General Care for the Body*—Work and rest, physical culture, care for the skin, the hair, the teeth, bathing, etc.

(b) *Women in Trade and Profession as well as in the Household*—An addition to the above mentioned group, dealing with the biological tasks of woman.

(c) *The Child*—Its development from birth, its feeding and education. Puberty, and its physical and psychical difficulties. Peculiar hygiene of the different age groups.

(d) *Physical Training*—Gymnastics, sports, plays. Anatomy, physiology, hygiene, methods of them.

(e) *Industrial Hygiene*.

(f) *The Human Mind and Mental Hygiene*—Already in 1911 it was realized that in addition to teaching biology of the human body also education about the human mind and its psychology is needed. A connecting link between physical and mental conditions of man is the intention of preventing both of them from becoming sick and therefore less efficient.

(g) *Food and Agriculture*.

(h) *Clothing*.

(i) *Housing*.

(k) *Disinfection*.

(l) *Separate Exhibit*—The Hospital.

III. Exhibits made through the national government, state, provincial, city and county governments; through insurance offices, through private health and hygiene associations, dealing with organization of hygiene and public health work.

IV. Exhibits made through foreign states and the Hygiene Section of the League of Nations.

V. Industrial Exposition.

Please use this letter in any form which seems suitable to you, when you find it might be of some interest for your readers.

Very sincerely,

DR. FELIX TIETZE.

Vienna, Austria

December 8, 1929

TO THE EDITOR:

We have heard overseas postgraduates complain that London is so large, and so complicated, that it takes a few weeks to learn the way around; they also say that, unless they come armed with letters of introduction to physicians or surgeons, it is difficult to obtain the facilities they require. The Fellowship of Medicine was founded to overcome these difficulties, and overseas postgraduates should, as a matter of course, come direct to the Fellowship where, without any charge, they can obtain information, advice and assistance.

We can—and every day do—save time for overseas postgraduates who ap-

ply to us either before leaving their own country or on arrival in England.

Perhaps the main point to be realised is that in England the Medical Year begins in October, and extends through the Winter and Spring until the end of July; August and September being the vacation months, opportunities for work are naturally somewhat curtailed, though the Fellowship endeavours to provide facilities for doctors who are only free for study during that time. We would add, however, that for overseas doctors their arrival in England in August or September means that they will have ample time to settle down and become acquainted with London before starting work in earnest.

We have been told that the information chiefly desired by overseas practitioners is the dates of the various examinations for degrees and diplomas, and the dates, duration and opportunities for securing resident positions in London hospitals, as well as the facilities for Special Courses of instruction. All this information the Fellowship of Medicine is in a position to provide.

As far as the Fellowship itself is con-

cerned, opportunities for clinical work all the year round are provided in the 40 London hospitals with which it is associated, as well as the Special Courses,\* and also weekly (free) lectures during the Winter months, and weekly (free) clinical demonstrations (except during August and September). In addition, the Fellowship publishes monthly the *Post Graduate Medical Journal* containing postgraduate lectures, clinical demonstrations, reports of cases, and information on the various courses of instruction. Above all, however, the Fellowship endeavours to help in every way possible medical practitioners requiring advice and assistance, by acting as a central bureau of information, and, of course, no charge is made for this service.

All enquiries should be addressed to the Secretary, Fellowship of Medicine, 1, Wimpole Street, London, W. 1.

Yours faithfully,

H. W. CARSON,

*Chairman of Executive Committee*  
LONDON,  
September 12, 1929

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\* Pamphlets available 1 Wimpole St., London, W. 1.

*A. P. H. A. Fifty-Ninth Annual Meeting*

*Fort Worth, Texas, October 27-31, 1930*

*Headquarters, Hotel Texas*

# ASSOCIATION NEWS

## STANDING COMMITTEES OF THE ASSOCIATION

THE Executive Board of the Association met in New York on November 16-17 and on December 6. John A. Ferrell, M.D., was designated by the Board as Chairman of the Nominating Committee, and the other members of the committee, one from each Section, were confirmed as follows:

George H. Bigelow, M.D.—Health Officers  
Roger G. Perkins, M.D.—Laboratory  
George H. Van Buren—Vital Statistics  
William H. Dittoe—Public Health Engineering  
Henry Field Smyth, M.D.—Industrial Hygiene  
James A. Tobey, Dr.P.H.—Food, Drugs and Nutrition  
LeRoy A. Wilkes, M.D.—Child Hygiene  
Ray H. Everett—Public Health Education  
Sophie C. Nelson, R.N.—Public Health Nursing  
John J. McShane, M.D.—Epidemiology

With respect to the four standing committees created under the new By-laws, the Chairman of the Board announced that Sally Lucas Jean had agreed to accept the chairmanship of the *Committee on Fellowship and Membership*, and the following additional members of the committee were confirmed:

George C. Ruhland, M.D.—Health Officers  
B. L. Arms, M.D.—Laboratory  
Louis I. Dublin, Ph.D.—Vital Statistics  
E. L. Filby—Public Health Engineering  
V. S. Cheney, M.D.—Industrial Hygiene  
F. C. Blanck, Ph.D.—Food, Drugs and Nutrition  
J. H. Mason Knox, M.D.—Child Hygiene  
H. E. Kleinschmidt, M.D.—Public Health Education  
Alta E. Dines, R.N.—Public Health Nursing  
John A. Ferrell, M.D.—Epidemiology

Similarly, the Chairman announced that Abel Wolman had accepted the ap-

pointment as Chairman of the *Committee on Meetings and Publications*. Additional members are:

Charles F. Wilinsky, M.D.  
John E. Monger, M.D.  
M. P. Ravenel, M.D.  
W. P. Shepard, M.D.

The appointment of members of the *Committee on Administrative Practice* was confirmed by the Board as follows:

C.-E. A. Winslow, Dr.P.H., *Chairman*  
Haven Emerson, M.D.  
Louis I. Dublin, Ph.D.  
George C. Ruhland, M.D.  
Henry F. Vaughan, D.P.H.  
Allen W. Freeman, M.D.  
Charles V. Chapin, M.D.  
Sophie C. Nelson, R.N.  
George T. Palmer, Dr.P.H.  
Michael M. Davis, Ph.D.  
W. S. Rankin, M.D.

George D. Lummis, M.D.  
W. F. Draper, M.D. } Officers of Health Offi-  
E. L. Bishop, M.D. } cers Section  
John L. Rice, M.D. }

The organization of the *Committee on Research and Standards* was deferred until the next meeting of the Board.

Meetings of the three standing committees organized have been held. Sub-committees are as follows:

### *Committee on Fellowship and Membership*

Sub-committee on Eligibility  
Sub-committee on Membership Promotion  
Sub-committee on Affiliated Societies  
Sub-committee on Sustaining Membership

### *Committee on Meetings and Publications*

Journal Editorial Sub-committee  
Sub-committee on Annual Meeting Program  
Sub-committee on Journal Advertising and Annual Meeting Exhibits

### *Committee on Administrative Practice*

Sub-committee on Record Forms  
Sub-committee on Rural Health Work

# PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

**Conquering Diphtheria**—The Philadelphia Department of Public Health in *Healthfax* for November 11, 1929, reports approximately 70,000 children immunized during the recent campaign under the direct supervision of the Department of Public Health. Up to that date there had occurred 828 cases of diphtheria during the year 1929 as compared to 1,731 cases for the same period in 1928, a reduction of 52 per cent in the morbidity total.

In the November 2d *Weekly Bulletin* of the New York City Health Department it is reported that during the first 9 months of 1929 there were 107 deaths of diphtheria and 1,406 cases less than the average for the corresponding period of the previous 6 years. During the first 9 months of the year, 165,000 children were immunized with toxin-antitoxin.

**Diphtheria Prevention in Yonkers**—E. G. Littell, M.D., Medical Director for the Board of Education at Yonkers, reports upon an interesting and successful endeavor to stimulate the school principals toward securing the immunization of pupils. In Yonkers there is a great deal of rivalry among the school principals and nurses, and it takes but a suggestion to spur them to action. Recently when School No. 20 was first on the list with 96.4 per cent immunized, and School No. 9 was second with 96.2 per cent protected, the principal of the former school remarked that his lead was altogether too slight and he therefore renewed his effort to secure the immunization of the 26 remaining pupils. Two of these received toxin-antitoxin from their own physicians; in 5 instances the principal asked permission

to take the pupils to a clinic in another school. He was therefore able to raise the percentage of immunized children to 97.3, thus putting his school far in the lead. This school is composed chiefly of children of foreign born parentage.

**Influenza Incidence**—During the epidemic of influenza which swept through the United States during the winter of 1928-1929 an incidence survey was made in the towns of Brewster and Eastham, Mass., located on Cape Cod. A special study was made of the more important epidemiological factors involved in the spread of the disease and also of the outstanding clinical features.

The disease followed the common routes of travel. It was found that personal contact could be held accountable as a means of transmission in approximately 86 to 88 per cent of cases. The total incidence of influenza in Brewster was 33 per cent and 18 in Eastham. The incidence was higher among children, particularly those of school age, than among adults. The family incidence in Brewster was 45.2 per cent; in Eastham 26.9 per cent.

In an effort to determine the source of infection it was found that intimate contact with a clinical case could be established in most instances, and the incubation period was from 2 to 3 days, although the extremes varied from 1 to 10 days. The acute symptoms lasted from 2 to 4 days. Although there were many complications, the most common being pneumonia and otitis media, in the main the disease was uniformly mild and the fatality rate, even in those complicated with pneumonia, low.—S. B. Krámes, *J. Prev. Med.*, 3: 433 (Nov.), 1929.

# LABORATORY

C. C. YOUNG, D. P. H.

## CONVENIENT PLATINUM NEEDLE

C. S. MUDGE, F. A. P. H. A.

*Associate Professor Dairy Bacteriology, Dairy Industry Division,  
University of California, Davis, Calif.*

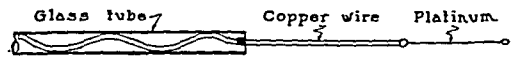
IT has been the observation of the writer that in many laboratories which he has visited, the platinum needle used was perhaps the one article which had not been improved in the course of time. It was his experience to find usually a glass rod with a wire pushed into the end. Now and then he observed one of the patent arrangements which have jaws to grasp the wire, but these are expensive and soon corrode.

For some time we have used a platinum needle which is cheap and easily made; so it is felt that a description of it might add to the sum total of useful kinks to be used about the laboratory. Figure I is a drawing of the needle as used.

It consists of a glass tube, one end of which may be rounded off in a flame.

Into this glass tube is inserted a copper wire, which is bent in the fingers so as to take a deal of pulling to remove from

FIGURE I



the tube. Into one end of the copper wire a bit of platinum is fused. This fusing is done by holding the two wires in the flame. The copper will soon melt and a little ball of molten copper will form on the end of the wire, into which the platinum—heated to redness—is quickly thrust.

A little practice may be necessary in making the first one, but it will be found to be a very handy needle, much more slightly than the average, and much cheaper than the patented affairs with the jaws which bite into the platinum.

## THE COMMINUATION OF BLOOD CLOTS FOR CULTURES

T. F. SELLERS, F. A. P. H. A., and JANIE F. MORRIS

*State Board of Health, Atlanta, Ga.*

THE culturing of blood clots is rapidly becoming a routine procedure in a number of laboratories. Specimens of whole blood are received at the Georgia State Laboratory to be examined by agglutination tests for typhoid, Brill's (typhus), undulant fever and tularemia, also for syphilis by the Wassermann and Kahn tests. Ninety-

five per cent of all such specimens are submitted in Keidel vacuum tubes.

After the serum is drawn off for the serological tests the clot is placed into bile glycerine, broth or brain liver infusion (Hibler's), depending on the purpose of the culture. Where only a typhoid or paratyphoid culture is requested, the clot goes into bile glycerine



medium and is dissolved. If any general or specific culture other than typhoid or paratyphoid is requested, the clot is placed in plain or glucose broth or Hibler's which does not dissolve it. It would, therefore, be possible for organisms to be trapped in the mass so as not to escape. Such cultures may be negative even after several days' growth. To avoid this possibility it was necessary to devise a method of breaking up or comminuting the clot. Two methods have been devised.

Because of the tough slippery nature of the clot, such instruments as stiff platinum needles, glass rods, scalpels and forceps proved unsatisfactory. It was found that the ordinary three pronged long handle pickle or oyster fork with the tips of the prongs ground down to a cutting edge about  $\frac{1}{8}$  inch in width answered the purpose fairly well. After the clot has been dropped into the medium the sterile fork is used to chop it into small particles.

While the pickle fork method was a great improvement over any device previously tried, its use at best requires several minutes during which time the mouth of the culture bottle or flask is exposed to contamination; so we tried forcing the clot through the nozzle of a Luer syringe. This works excellently. An ordinary 10 c.c. Luer syringe is sterilized, preferably by dry heat. After sufficient serum has been withdrawn for study, the remainder of the specimen, including the clot, is dropped into the barrel of the syringe, the plunger inserted for a short distance, and the barrel turned with the nozzle upward, to expel the air with the plunger. The nozzle is then held over the mouth of the medium container and the clot "spued" into the media by pressure on the plunger. A thorough comminution of the clot is thus obtained. In our experience this is less apt to be attended with extraneous contamination than the pickle fork method.

## VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

**Health in Iceland**—In many respects, public health problems in Iceland are unique. There are many striking differences in the behavior of certain diseases in Iceland and in other countries. The country's remarkable immunity to certain diseases which are relatively common elsewhere is, to a large extent, an unsolved problem. Acute rheumatism is very mild and resultant cardiac complications are infrequent. Lobar pneumonia is frequent, 19 per cent of the cases occurring in patients under 15 years of age. Diabetes is almost unknown and cancer of the uterus is very rare. Cerebral apoplexy is common in the almost complete absence of

syphilis and it has been observed that cerebral apoplexy runs in families.

There are about 100 doctors in Iceland, 48 of whom act as medical officers of health. Few figures are so demonstrative of the progress made during the last decades as those dealing with vital statistics. The average infant mortality of 52.3 per 1,000 births in the 5-year period 1921-1925 is among the lowest, if not the lowest, in Europe. Until the last quarter of the 19th century, tuberculosis was hardly known in Iceland. In 1921, the number of notified cases was 745, and in 1927, the number increased to 1,100. The tuberculosis death rate for the period 1911-1915,

with an annual average of 147 deaths, was 1.7 per 1,000 population and in the period 1921-1925, with an annual average of 186 deaths, the rate was 1.9 per 1,000 population. The first tuberculosis sanatorium was built in 1910. Leprosy was formerly rife in Iceland but in 1927 the number of lepers was reduced to 44. Gonorrhea became endemic in 1890 and syphilis after 1900. The influenza epidemic of 1918 reached Iceland and lasted for 5 months. Three districts escaped completely by voluntary isolation. A serious outbreak of epidemic pleurisy occurred in 1926. An epidemic of measles was imported in 1924 and lasted until 1926. Prevention by injection of the serum of convalescents was found effective in some districts.

Hydatid disease of the liver was so common 60 or 70 years ago that 2 per cent of the inhabitants were supposed to suffer from it. Drastic measures have been taken against it and it is now becoming rare. Enteric fever has long been endemic in Iceland, with serious outbreaks from time to time. Scarlet fever became endemic early in the present century but only 5 cases were reported in 1927. Acute poliomyelitis had been rare until 1924 when a serious epidemic broke out suddenly. An epidemic of whooping cough was imported in 1926. The rarity of rickets is in dispute but it is far from being as common in Iceland as in the Faröe Islands.—Observations in Iceland, *Lancet*, 2: 745-750 (Oct. 5), 1929; *Lancet*, 2: 801-802 (Oct. 12), 1929.

**The League Steps Out for Greece**  
—The League of Nations was requested to make a study of sickness and its prevention in Greece and present a plan for national health administration. The Health Committee accepted the obligation and a survey was begun. The group of health surveyors found a population almost exactly that of New York

City; no machinery for disease control except port quarantine; about 30 trained nurses; death rates of about 14 to 22 per 1,000 and birth rates about 18 to 30 against a death rate averaging 12.3 and a birth rate 19.7 in the registration area of United States. They found 23 per cent of deaths so indiscriminantly reported as to be unclassifiable.

Typhoid rates in Greece are about 40 to 53 per 100,000, due to water soiled by surface drainage. About 20 per cent of deaths are from diarrhea and enteritis in children under 2 years, and about an equal number from tuberculosis, with malaria a close third. There is no compulsory notification of acute communicable diseases of childhood or of tuberculosis or venereal disease. The prevalence of scarlet fever and diphtheria is very low. Tuberculosis was not serious until the housing and economic crises of the past decade; the rate in Athens in recent years has reached 400 per 100,000 population and now is 300 or over. Similar tuberculosis rates prevail in Patras and Corfu and rates as high as 544 are reported from the smaller Cyclades. In rural regions where grazing and grain growing conditions are good, rates of 150 or under are found. Malaria is prevalent in Peloponnesus and Macedonia, from 30 to 90 per cent of children being found with malarial infection by means of the spleen index. Trachoma is a steadily increasing scourge and is prevalent in from 5 to 10 per cent of all school children. Athens disclosed 75 to 100 active cases of leprosy under no administrative supervision and without medical control. Only a few hundred of the probable 1,000 lepers in Greece are exiled. As would be expected, rabies is rampant.

The maternal mortality of Greece is low, apparently because of the small amount of interference with delivery and the vigorous physical condition of peasant women. Owing to the prevalence of breast feeding, infant mortality

in Greece is not high. Although it reaches 140 in some cities, it is more commonly 90 per 1,000 live births and is found as low as 60.

After 6 months of training in England and various European cities and rural areas, a picked group of young Greek physicians will, in February, form as members of the School of Hygiene and Health Center in Athens the nucleus of a permanent Hellenic Health Service. For 5 years the League will provide a professor of preventive medicine and director of the school, a chief of a division of malariology, and a sanitary engineer. The organization will be that of centers serving health districts according to local needs and subject to technical direction and advice from the Athens center and School of Hygiene.—H. Emerson, *Survey*, 63: 283-286, 308-309 (Dec. 1), 1929.

**Sickness in Essex County**—An intensive morbidity study was carried out in Essex County from October, 1927, to September, 1928, to supplement the Rural Survey conducted by the New York State Department of Health in 1927. The estimated population of Essex County is over 18,000, the number of persons for every physician averaging about 900. The cases of sickness totalled 19,179. Communicable diseases numbered 312, or 1.6 per cent of the total cases. The number of cases of sickness reported among women was slightly higher than among men. Surgical cases numbered 2,641 among men and only 1,312 among women. The leading cause of non-reportable diseases was cold with a total of over 5,000 cases, or 26.8 per cent of all non-reportable diseases. Surgical cases (except gynecological) were responsible for 21.0 per cent, followed by cases of digestive disorders with 12.2 per cent, that is, 60 per cent of all causes of sickness were listed under these three heads. Of the 1,055 cases of nervous disorders, one-

seventh were given as organic and the rest functional. Cases of diseases of the skin totalled 851, one-third of them being contagious. Of the total 535 cases of diseases of the heart, 121 were rheumatic, 9 syphilitic and 405 classified as "other forms." There were 30 cases of syphilis reported, 2 being congenital and the rest acquired.

Surgical cases represented 28.3 per cent of all cases among males and 13.8 per cent among females. Cases of digestive disorders were more prevalent among women, 13.6 per cent, as compared with 10.8 per cent among men; and the proportion of cases of nervous disorders was more than double the corresponding figure for men, 8.0 per cent and 3.1 per cent respectively. Among women, one-tenth of the total of sickness was headed gynecological. Operative treatment was needed in 130 of the 1,001 cases reported. The number of cases of gonorrhea among men, 165, was 6 times that among women, 28, corresponding percentages being 1.8 and 0.3.

The leading reportable disease was scarlet fever with 35.6 per cent of all cases, followed by mumps, 18.3 per cent, and pneumonia, 14.4 per cent. Gonorrhea is the most prevalent communicable disease in the section of the county represented in the survey, the total number of cases exceeding by more than 70 per cent that reported for scarlet fever. Syphilis was sixth, taking precedence over tuberculosis. The greatest amount of sickness, 26.7 per cent, occurred during the three winter months and the least, 23.3 per cent, during the third quarter of the year.

Comparing the Essex County Survey and the Rural Survey, it was found that in general the points of similarity were much more numerous than the points of difference. Communicable diseases represented a higher percentage, 3.3, in the Rural Survey than in the Essex County Survey, 1.6 per cent. The proportions of colds in the two surveys were practi-

cally the same. This survey was valuable in that it gave support to the important facts brought out in the more extensive Rural Survey.—J. V. Deporte, *New York State J. Med.*, 29: 1310-1316 (Nov. 1), 1929.

**A Smallpox Outbreak in Massachusetts**—This is a report of an outbreak of mild smallpox in one Massachusetts community with a population of about 10,000 over a period of 4 months. There were 223 cases reported and no deaths occurred. The 223 cases occurred in 113 families totalling 620 individuals. After 65 cases had been reported as chicken pox, an investigation was made and all of the cases were pronounced smallpox. From 1924 to 1928 about 86 per cent of the cases of chicken pox that occurred were in the 0-9 year age group, whereas in this outbreak of smallpox but 19 per cent of the cases occurred in the same age group. Most of the cases were very mild and of the discreet type. About 9,600 individuals were vaccinated within 3 days of the analysis of the disease. Only 2 of the 223 cases had been successfully vaccinated and these more than 30 years ago. Of 23 contact cases that developed outside the community, 22 were in nearby Massachusetts towns and 1 in New York City. Of these, only 4 had been previously vaccinated, and these more than 20 years ago. Forty-one cases were distinctly modified by vaccination. Nineteen of these 41 cases had their onset within 3 days after vaccination. Seven of the 23 contact cases were modified by vaccination. Up to July 1, 1929, Massachusetts had reported 272 cases of smallpox, 223 being directly concerned with this outbreak and 23 of them contact cases. Massachusetts has not had as many as 272 cases of smallpox reported in any previous year in the past 26. This particular community had evaded the compulsory public school vaccination law

for a number of years.—P. McKnight and L. Scamman, *New England J. Med.*, 201: 361-362 (Aug. 22), 1929.

**Diabetes Record for 1928**—A study of preliminary census returns from 21 states and Hawaii showed that the number of diabetes deaths had increased from 6,093 in 1927 to 6,808 in 1928. Nineteen states showed increases in the death rates, while only two, Delaware and New Hampshire, showed declines. In spite of a decrease of 2.4 per 100,000, New Hampshire reported a rate of 27.9, the highest rate for the 22 localities. Vermont had a rate of 27.0 and Arizona, 5.9, the lowest reported. A further study of 50 cities since 1912 showed an increase in the diabetes death rate from 15.9 to 23.2 per 100,000 in 1928. The rates for last year were the highest on record. Another study of the diabetes death rates for 1927 and 1928 for 141 cities of the United States based for the last year on a population of nearly 38,000,000 showed that diabetes death rates had increased in 94 cities and declined in 47 others. The rate for the 141 cities increased from 19.4 per 100,000 in 1927 to 22.1 in 1928. Of the 141 cities, Yonkers had the highest rate for 1928, 44.5, closely followed by Schenectady, 42.9, and Utica, 40.3 per 100,000. The 6 largest cities in the United States, all with a population of a million or more, showed increases from 0.6 per 100,000 in Detroit to as much as 5.6 in Cleveland. The New York City rate showed an increase of 3.1 and the rate for Philadelphia increased 4.9 per 100,000. A detailed study revealed no particular concentration of diabetes deaths in any section of the country. Some very curious contrasts resulted. The rate for Minneapolis was 24.1 per 100,000 while that for St. Paul was 13.4. The rate for San Diego was 35.9 as against only 14.9 for Los Angeles. A study of frequency rates and the per capita sugar consumption for 8 countries

confirmed the viewpoint that an excessive sugar consumption is one of the direct contributory causes toward an excessive death rate from diabetes. Italy with a diabetes death rate of 5.5 per 100,000 and a sugar consumption per capita of 8.1 kilograms showed quite a contrast to the United States with a rate of 17.3 and a per capita sugar consumption of 48.1 kilograms.

Diabetes is less common among negroes than whites. In 1926, the adjusted diabetes death rate for the registration area of 1920 was 18.1 per 100,000 for the white population and 12.7 for the colored. In a typical state, as South Carolina, the rate for the white population was 10 per 100,000 while the negro rate was 8.1. In Tennessee the negro rate, 9.2, exceeded the white rate of 8.6. The death rates for females are higher than those for males. In 1926, the adjusted male diabetes death rate was 14.1 against a rate of 20.9 for females.—F. L. Hoffman, *Spectator*, 123: 19–21 (Nov. 7), 1929.

**Vital Statistics for Northern Ireland**—The Registrar-General of Northern Ireland has just published the annual report for 1928. This report is the first for Northern Ireland to contain death rates standardized for age and sex distribution of the population. These rates are the ones that would be experienced if the mortality rates of the

community at various ages and sexes were to prevail in a population selected as standard. The standard population adopted is that of England and Wales in 1901, and as this is also used as a standard for England and Wales, the rates for the two countries are comparable. The standardized rate for Northern Ireland in 1928 is 11.6 per 1,000 population, which compares with a rate of 9.9 per 1,000 for England and Wales. A notable feature of the comparison of the standardized rates is the relatively high rates for females in Northern Ireland, these rates being on the average in the years 1926–1928 about 96 per cent of the rates for males whereas the corresponding ratio for the England and Wales rates is only about 81 per cent. In general, the more rural areas of Northern Ireland enjoy the lowest death rates.

The report also includes annual abstracts giving in detail the number of marriages, births and deaths during the year. The birth rate for 1928 was 20.8 per 1,000 of the estimated population, or 0.5 below that for 1927. There are included numerous comparative tables and notes relating to infant and maternal mortality, inquests and causes of death. Of all single defined diseases, heart disease bears the greatest proportion to the total deaths at all ages, which is the usual experience.—*Annual Report for Northern Ireland for 1928*.

# PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

## STREAM POLLUTION CONTROL IN ILLINOIS

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UNTIL July 1, 1929, three separate state departments had some jurisdiction relative to stream pollution prevention and abatement, and a fourth department made studies and investigations of pollution but had no authority to take corrective action. This divided and overlapping authority did not make for efficiency or economy in field investigations nor promote effective action. Further, it resulted in separated records dealing with the pollution and the quality of the waters in Illinois. Also, none of the laws under which the departments operated up to July 1, 1929, were very definite or fully effective for handling sewerage and stream pollution work.

The Illinois government under the governor is divided into 11 departments, with a director of each department appointed by the governor. The departments in turn are divided into divisions. The stream pollution law that became effective July 1, 1929, established the Sanitary Water Board composed of the directors of the 4 departments that have interest in some phase of stream pollution, sanitation, and conservation, and a fifth member appointed by the governor to represent manufacturing interests: The 4 departments are Public Health, Conservation, Agriculture, and Purchases and Construction (Division of Waterways). The chief sanitary

engineer of the State Department of Public Health is designated as ex officio technical secretary of the board.

The law makes it the duty of the Sanitary Water Board to study, investigate and determine ways and means of eliminating pollution from the streams and waters of the state, and of preventing such pollution that is detrimental to public health or to the health of animals, fish, or aquatic life, or detrimental to the practical use of the waters for recreational purposes.

Pollution is defined by this act as existing in any of the said waters if,

... as the result of any discharge of any liquid or solid substance, the quality of any of said waters, after reasonable treatment, is impaired for public water supply, bathing or recreational purposes, if said waters were reasonably capable for use for public water supply, bathing or recreational purposes before the discharge occurred of which complaint has been made to said Sanitary Water Board; or, if obnoxious odors result from such discharge into any of said waters near buildings, roads and lands occupied or used by human beings, *provided* that odors shall not be deemed to be obnoxious in any case where the Sanitary Water Board has determined that the discharge causing such odors does not constitute pollution within the meaning of this Act; or, if the quality of any of said waters is impaired for the use of live stock, or kills, or is injurious to fish life, when said waters were reasonably practicable for use for watering live stock or for fish life.

The Sanitary Water Board shall have the

Additional work has included special analyses of river samples at critical points, analysis and measurement of certain industrial wastes and sewage, inspection of industrial plants, and other field investigations properly coming within the scope of the activity.

The working personnel has been as follows:

*North Central District*—One sanitary engineer, employed by the committee on full-time basis, a faculty member of the chemistry department half-time during summer months, one graduate student and one undergraduate student during the four summer months.

*Southwest District*—First assistant engineer of the State Department of Health (about one-third of his time), a member of a faculty half-time for four months, one graduate student full-time for four months, and a student full-time for two months. In addition, three other members of a faculty have given assistance.

Necessarily, the general supervision and planning of the surveys has required a considerable portion of the time of the chief engineer of the State Department of Health.

The biological studies are being made by a graduate of the University of Virginia, in connection with his work for a doctor's degree.

Mention should be made of the survey of the James River by the City of Richmond during the fall of 1928. This was undertaken in order to determine the causes of certain difficulties at the water filtration plant. The conclusion was reached that wastes from a large paper plant, 245 miles upstream, seriously interfered with the chemical treatment of the supply during low river stages and that certain other trade wastes were partly responsible in a lesser degree. A well known firm of consulting engineers was employed. The cost of the survey was about \$10,000. A report has not been published.

## STREAM POLLUTION IN WEST VIRGINIA

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WEST Virginia has had anti-stream pollution laws in the past similar to those in other states. The Game and Fish Commission was interested in so far as the pollution affected fish life and did some very good work in reclaiming some streams. The law was difficult to administer as it strictly prohibited dumping of material injurious to fish life into the streams. The suits brought by sportsmen and others were not effective in eliminating the condition, but rather stirred up ill feeling between the industrial and recreational groups. The situation called for a program of scientific study and re-

search rather than the imposition of fines.

The Health Department was interested in stream pollution in so far as the pollution affected the public water supplies. The supervision of sewage disposal also directly connects this department to any program of stream reclamation.

Each year the problem of stream pollution came up for discussion at the short school, held jointly by the Sanitary Engineering Division of the State Health Department and the College of Engineering at the State University, for the instruction of filtration plant oper-

ators and water works superintendents. They recommended that the Legislature provide funds for research on stream pollution.

The coöperative effort of the state sanitary engineers on the Ohio River watershed and industry in removing the phenol wastes from the streams gave impetus to the movement for stream pollution control.

An attempt was made to secure the coöperative support of a group composed of representatives from the State Health Department, State University, Manufacturers Association, Coal Operators Association, Fish and Game Commission, Wild Life League, and the Conference on Water Purification, to a research program financed by the Legislature and carried on at the University of West Virginia.

The industrial group felt the need for a definite program or policy regarding stream pollution and realized the inadequacy of the law at that time, and other groups, such as the recreational and public health, wanted more effective legislation too. Hence, a committee made up of representatives from each faction met and drew up a bill for presentation to the Legislature. This bill creating the State Water Commission was passed by the legislature, signed by the Governor and became effective June 1, 1929.

The State Water Commission is composed of the Commissioner of Health, the Chairman of the Public Service Commission, and the Chairman of the Game and Fish Commission. The Director of the Division of Sanitary Engineering in the State Health Department is required to perform such services as may be requested by the Commission in connection with its duties. The College of Engineering at West Virginia University is requested by the law to render such assistance, in so far as it can, in the study of ques-

tions connected with pollution of waters. The Commission has elected the Commissioner of Health as its Chairman and has selected the Director of the Division of Sanitary Engineering as its Secretary. Executive authority is vested in the Commission.

The law authorizes the Commission to investigate, hold hearings, and enter orders regulating specific cases of pollution. It may specify the system to be used, or correct and approve the plans submitted. The cost of the installation, maintenance, and operation of the system must not be unreasonable or inequitable. The Commission may cause the enforcement of any of its orders in the courts. Any person aggrieved by an order of the Commission has recourse to the courts.

At present the funds for the operation of the State Water Commission come from the three commissions represented on it, each bearing an equal share. These funds are limited. The Legislature in passing the bill did not provide funds for its operation. A provision was made in the act whereby the Commission could coöperate with any public or private experimental agency and receive therefrom, on behalf of the state, and for deposit in its treasury, any money such agency might contribute as its part of the expense. The personnel now consists only of a chemical engineer working under the direction of the Commission and doing both the field and laboratory work.

During the past summer a study was made of the Cheat River Basin in which the various sources of pollution were located and classified. The quantity and quality of the wastes were determined as well as their effects upon the stream. Studies were made upon the self purification of the stream and its recovery from the pollution load. A detailed study was made of the lake formed by a large water power dam lo-



cated at Cheat Haven. This report has been printed for distribution. The work was carried on jointly by the State University represented by the Professor of Sanitary Engineering, and by the State Water Commission represented by its chemical engineer. The report was written jointly. Since the wastes from mines constitute a serious problem in this state, the State University is planning a research program upon this subject. An advisory board has been formed of prominent mine operators and engineers to assist in the work.

A reconnaissance survey was made of the tanning industry within the state

and an agreement has been formed whereby a more efficient and satisfactory disposal of tannery wastes will be instituted.

The Commission has also become interested in sewage disposal and has informally requested action in two critical conditions where public water supplies are affected.

Future work includes a study of the public water supplies of the state and detailed work on tannery and other industrial wastes. A detailed pollution survey and study will be made of another watershed with the coöperation of a municipal water board engineer located on the shed.

**Solving Oil Field Waste Disposal Problems**—The Santa Fe Springs Waste Water Disposal Company, a non-profit coöperative organization, was formed by 20 oil producing companies to dispose of the salt water brought to the surface in oil well operation at Santa Fe Springs, Calif. The waste water is passed through settling and skimming tanks to remove mud and oil, raffle ramp aerators being provided to release oil in suspension. These tanks reduce the oil from an initial content of 400 or 500 p.p.m. to about 12 p.p.m., resulting in a daily oil recovery ranging from 200 to 400 bbl. A vitrified clay pipe line varying from 18 to 24 inches in diameter carries the effluent waste water 81,000 feet to the ocean.—Anon., *Eng. News-Rec.*, 102, 20: 795-798 (May 16), 1929. Abstr. D. E. Kepner.

**Movement of Water in Alluvium.**—To determine the possibility of procuring a certain amount of underground

water in the Loire Valley (France), the studies described here were made. The underground water in this valley comes partly from the bed of a river and a canal by percolation, and partly from drainage from the hills. The point of contact between the hill and the river waters has a to-and-fro movement. As a means of finding the proportions of each type of water, chemical analysis was used as the hill water has a larger chalk content. Temperature was employed also, as the conduction of heat to deep levels in the earth is known to be small.

To find the direction of flow in the ground, iron tubes having perforations were sunk at the angles of a pentagon. In the center other similar tubes into which colored solutions were poured were sunk. The strength of the solution as it appeared in the outer tubes gave information concerning the flow.—F. Dienert, *Ann. d'hyg.*, V: 6, 669-691, 1928; *Bull. Hyg.*, 4, 4: 324 (Apr.), 1929.

# INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

## The Evaluation of 5 and 7 Per Cent Carbon Dioxide Mixtures as Respiratory Stimulants—Summary—

1. Healthy young adults at rest experience very varied degrees of response when given inhalations of 5 and 7 per cent carbon dioxide in air. 2. In some subjects the response to 5 per cent carbon dioxide consists in little more than a doubling of the normal minute-volume. 3. Seven per cent carbon dioxide induces the maximal ventilation obtainable without causing undue discomfort to normal subjects. 4. The same subject breathing identical concentrations of carbon dioxide responds differently on different days but does not lose his characteristic type of response.—Emery Haller, Walter Killiches, and Cecil K. Drinker, *J. Indust. Hyg.*, XI, 9: 293-313 (Nov.), 1929.

The Use of 7 Per Cent Carbon Dioxide and 93 Per Cent Oxygen in the Treatment of Carbon Monoxide Poisoning—From the conclusions: A study of the experience since 1923 in the use and experimental examination of the effects of 5 per cent carbon dioxide and 95 per cent oxygen in the treatment of carbon monoxide poisoning has indicated the wisdom of increasing the concentration of carbon dioxide to 7 per cent for the first 5 to 20 minutes of treatment. No experimental or clinical evidence has appeared indicating that the increase in carbon dioxide to 7 per cent carried with it the slightest danger. Indeed, all facts point to benefit to the circulation from 7 per cent carbon dioxide in 93 per cent oxygen. Three hundred cases have been so treated, and the treatment completed

with the usual 5 per cent mixture. The results of this field work have been uniformly good.—Cecil K. Drinker and Thomas J. Shaughnessy, *J. Indust. Hyg.*, XI, 9: 301-313 (Nov.), 1929.

Some Physiologic Reactions to Cooling Power during Work, with Special Reference to Evaporation of Water—From the summary: The cooling effect of wind caused a decrease in pulse rate, but this was observed less in lightly clothed subjects than in those nearly naked. Also, the increase was greatest under the warmest conditions studied, i.e., in the lightly clothed subjects working in moist air.

Rectal temperatures as a rule, but not always, increased slightly, by 0.5 to 1° F., during work at 25° C. Again, the heat produced during work was three times that produced while at rest. There are likewise variations in the response of different subjects with regard to water evaporation—from nil for the coldest conditions to 240 gm. per hour under the warmest conditions.

"Greater use should be made of removal of clothing and movements of air to render conditions comfortable for indoor muscular workers. If this is done, there is a wide range of atmospheric conditions above and below 15° C., under which comfort is attained with moderate work."—J. Argyll Campbell and T. C. Angus, *J. Indust. Hyg.*, XI, 9: 315-327 (Nov.), 1929.

Physical Examination of Athletes—A movement concerning chiefly working classes has resulted in the physical examination thus far of more than 3,000 young men and women, ranging in age

between 15 and 24, and the results are a great surprise, for more than 50 per cent of the persons who engaged in sport activities presented defects of such a nature as to make such participation inadvisable. Especial attention was given in the examination to the heart, lungs, gastrointestinal tract, and a functional testing of the organs of circulation and respiration, of the eyes and ears, and a urinalysis.

The most frequent obstacles to participation in sports lay in disorders of the lungs and the heart, the existence of which the patient was not infrequently unaware. Anomalies of the spine, disease of the tonsils, and flatfoot and sagfoot were very frequent, the last two in workmen.

In women, hysteria was a frequent condition and to these mountain climbing and swimming were usually forbidden. Nevertheless interest in sports has resulted in a marked decrease in smoking and drinking in all classes.

The sport committees have decreed that only such athletes may participate in contests as have submitted to a careful examination. "It is an interesting fact that especially football players and those who engage in heavy athletics endeavor to avoid the examination, if they are 'professionals,' because they fear the results."—*Vienna Letter, J. A. M. A.*, 93, 22: 1747–1748 (Nov. 30), 1929.

#### United Fruit Company, Medical Department, 17th Annual Report—

This volume of some 400 pages with many full-page illustrations in halftones, charts, diagrams, etc., devotes: Sec. I, to comments on some of the more important diseases occurring in the tropical divisions of the company's interests; Sec. II, to a number of papers upon malaria; Sec. III, to dysentery, and other tropical diseases both of the employed and their families; Sec. IV, to surgical disabilities; Sec. V, to diseases of the special senses, pathology,

food poisoning, snake bite cases, etc.; and Sec. VI, to organization and vital statistics.

While malaria causes a greater amount of sickness than any other single infection on the plantations of the company, lobar pneumonia causes the greater number of deaths. The incidence of pneumonia does not differ materially from year to year while the fatality is high—28 to 37.5 per cent. Contributing factors are the lowered resistance of the native Indian, Negro and mixed races; the high labor turnover, which decreases the income; the malnutrition, malaria, hookworm, syphilis, etc., which exist; also the prevalence of influenza. The 1928 epidemic was mild in form and occurred in all the Central American, Columbian, and West Indian plantations except Cuba.

There were only 35 cases of typhoid fever among the employees in all of the divisions (apparently involving 55,604 total employees), the chief sources of infection being traced to carriers and to flies. During the year nearly 8,000 injections of typhoid vaccine were used. Amebic dysentery has decreased from 536 cases with 17 deaths in 1926 to 331 cases with 3 deaths in 1928. The bismuth-subnitrate method of treatment has proved simple and effective and few cases resist treatment, while relapses are rare. Beriberi is increasing in some of the divisions, there being a total of 42 cases reported in 1928. The degree of hookworm infestation in the localities where the company operates is generally low, and oil of chenopodium is the vermifuge of choice. This disease is not one which appears to play an important rôle in the prevailing anemia.

Not a single case of either smallpox or alastrim was encountered in any of the plantations during the year. Diphtheria in the tropics is rare and usually of mild character. Of 228 cases of pulmonary tuberculosis treated in the hospitals, 150 developed among the labor-

ing population while there was a total of 36 deaths. Erysipelas is treated by the application of pure carbolic acid until the surface turns white when pure alcohol is applied. The results have been exceedingly gratifying, the temperature falling within 3 to 6 hours, and no further treatment is necessary. Herpes zoster is treated by the same method, and usually within 24 hours the patient can return to duty. Likewise, 5 per cent methylene-blue in water seems effective in erysipelas. Venereal diseases are a serious menace and of growing importance. Laws are rarely enforced, so that the social leper is generally permitted to run rampant, and many cases have to be hospitalized.

(The interested reader should consult this very replete volume for further information covering the diseases of tropical workers who are under elaborate medical supervision.)—United Fruit Company, Medical Dept., General Offices, Boston, Mass.

**Sickness among Industrial Employees during the First Three Months of 1929**—During the past 9 years a group of approximately 35 sick-benefit associations in industry has reported to the U. S. Public Health Service the cases of illness and nonindustrial accidents causing disability for 8 consecutive calendar days or longer among its members, and the monthly number of male and female members. The results have been published annually, but the present report is an attempt to supply a current index of illness of the adult occupied population covered.

An increase of 38 per cent, compared with the first quarter of 1928, is shown in the incidence rate of disabilities lasting more than 1 week. The respiratory diseases showed an increase of 86 per cent—due to the influenza epidemic, which disease was 163 per cent more frequent than in the same period the year before. Likewise, the pneumonia

rate was 28 per cent higher. Deaths followed the increased frequency of sickness. A large insurance company reported an increase of 18 per cent in the industrial death rate for the quarter. In fact, the death rate for the quarter appears to have been higher than during the first 3 months of any year since 1920. Sickness from diseases other than respiratory had about the same frequency as in the previous year.—U. S. P. H. S., *Health News Release*, Jan. 1, 1930. See also *Reprint No. 1316* (Sept. 13), 1929.

**Efficiencies of Painters' Respirators Filtering Lead Paint, Benzol and Vitreous Enamel Sprays**—This determination of the efficiencies of respirators was made through a coöperative arrangement between the U. S. Bureau of Mines, the National Safety Council, and the U. S. Public Health Service. The specific questions which it was proposed to answer were as follows:

1. What filtering material, if any, is adequate—
  - (a) To reduce the lead content of the air to which a spray coater is exposed from 200 mg. per cu. m. to 0.6 mg. per cu. m.?
  - (b) To reduce the amount of benzol under similar conditions from 2,000 to 75 p.p.m.?
  - (c) To reduce the number of silica particles under similar conditions from 200,000,000 to 100,000 per cu. m. as determined by the Palmer method?
2. How long would a layer of such material function?
3. How do certain typical masks now available measure up to this standard?

In general, respirators with cotton, paper, or fabric filters remove 90 or more per cent of the lead from air carrying paint mist, and restrain none of the solvent vapors. The addition of a canister or cartridge of activated charcoal to the respirator removes all solvent vapors until the charcoal becomes saturated. Usually, fresh filters are necessary at intervals of several hours, while

fresh cartridges of charcoal must be used when the latter is saturated, but canisters may last for weeks before a change is necessary. Respirators were somewhat less efficient against the silica-dust sprays, although most of those submitted for tests were more than 50 per cent efficient.—S. H. Katz, E. G. Meiter, and F. H. Gibson (U. S. Bur. of Mines), *Pub. Health Bull.* 177, 27 pp. ill., June, 1928.

**Regulations for Spray-Coating—**These regulations set forth the rules to safeguard the lives, limbs, and health of workers in spray coating operations, and place the responsibility of compliance upon both the employer and employee, with provisions for penalty, also for petition for modification.

The pamphlet discusses administration, definitions, specifications—their application, the specifications for booths—exhaust systems, rules of cleaning booths and spraying equipment, containers for spray materials, electrical equipment, additional requirements for protection against fire, exceptions for use of noncombustible materials, and additional requirements for health and sanitation. A final section covers features for health protection and protection from fire, arranged as recommendations. Ten plates for setting up equipments are included.

Among particularly interesting features are the definitions, the handling of vitreous enamel and siliceous materials, the rate of air velocity in booths, and the 17 special recommendations for health protection.—Penn. Dept. of Labor and Industry (*Special Bulletin*), 35 pp., 1929 ed.

**Industry Reports, Published to Assist Underwriters in Classifying Industrial Hazards—**The following list of articles has been published during the course of the year 1929, and an Index to all Volumes, I to IV, inclusive,

has likewise been published. Each report consists of from 6 to 16 pages depending upon the nature of the industry or hazard discussed, and contains certain illustrations, tables, and an index to occupations (whenever a given hazard is discussed). Vol. IV, 1929:

- No. 1—Household Electric Refrigeration
- Nos. 2-3—Coke and By-products
- No. 4—Gypsum Industry
- No. 5—Turpentine
- No. 6—Tobacco Products
- No. 7—Chromium Plating
- No. 8—Industrial Alcohol
- No. 9—Lumber Industry
- No. 10—Physical Impairment in Clerical Occupations
- No. 11—Methanol (wood alcohol)
- No. 12—Artificial Leather
- Retail Credit Company, Atlanta, Ga.

**Health Hazards in Industry—**J. J. Bloomfield, Asst. Physical Chemist, U. S. Public Health Service, with 15 pages of discussion at the 15th Annual Meeting of the International Association of Industrial Accident Boards and Commissions. U. S. Bureau of Labor Statistics, *Bull. No. 485*, 130-156 (June), 1929.

**The Pathology of Silicosis of the Lung—**In Ontario, silicosis has been found to affect chiefly gold miners, granite cutters, and metal grinders, but occasionally cement workers and quarrymen are affected. Clinically the study of this disease has practically reached a standstill, but pathologically it presents many aspects which invite investigation.

The lungs of 12 autopsy cases were carefully studied and the silicotic lesions divided into 5 different stages (which are described). The known periods of exposure ranged from 4 to 27 years. The diagnosis had been: 6 of tuberculosis, 2 of nephritis (including 1 with lobar pneumonia), 1 pneumonia, 1 heart disease, 1 external violence, and 1 unknown (mitral stenosis). The known

silica content of ash of the lung (shown in a table) varied from 6.24 to 45.32 per cent. Doubly refracting particles seen under the high power in 4 or more selected fields ranged from 3 to 96, while exogenous pigment of clay, iron, and carbon nature was present in all.

There was found to be no parallel between the amount of visible crystals and the per cent of  $\text{SiO}_2$  in the ash, and the term "occult" is used to designate that portion of the silica which is invisible. "Occult" silica varies directly as the amount of fibrosis present.

Gye and Purdy judge it probable that inhaled silica is slowly transformed into colloidal silica, and the present study tends in every way to support this view. In theory, the disease must be progressive for some time after the individual leaves his dusty occupation, the progression either taking the form of increased fibrosis or of increased susceptibility to tubercle infection. (The major part of the article discusses the pathological sequence of events leading to silicosis, with 3 half-tone illustrations.)

The probable path of entry for the tubercle bacillus is by aspiration. In the early stages of silicosis, the victim is more resistant than usual to the infection, but in later states he becomes more susceptible. The peribronchial lymph glands remain singularly free from tuberculosis in cases of tuberculo-silicosis, although such may also be true of uncomplicated tuberculosis.

Pneumonia is a great hazard in the earlier stages when dust inhalations block the lymphatic exits and fibrosis is slight. Thus, according to Collis, conditions favorable to pneumonia are usually unfavorable to tuberculosis, and *vice versa*.

The association with nephritis, previously noted by Collis, Gye and Purdy, is borne out in the fact that the 2 of the 12 cases here discussed died of nephritis.—T. H. Belt, Dept. of Pathology, University of Toronto, *Canad. Pub. Health J.*, XX, 10: 494–508 (Oct.), 1929.

**Some Aspects of Silicosis in Industry**—A group of cases recently seen were treated for pulmonary tuberculosis and silicosis was not suspected until a post-mortem examination was held on one of them. They were working in a small factory handling raw material (quartz) to be made up into a scouring powder, where even the process of filling the tins was accompanied with much dust.

There were altogether, within a period of 2 years, 6 or 7 deaths among the workers in this small factory in which not more than 15 persons—among whom 5 of the deaths which occurred were of young women—were at the same time employed.

Silicosis *per se* is an occupational risk of primary gravity, and allied with tuberculosis it forms the most fatal and at the same time most preventable group of tuberculosis cases.

It is surprising, therefore, to find how long it has taken the State to recognize these important facts, and it is only within the last few months in England that the provisions of the Workmen's Compensation Act have been applied to this occupational risk. The Dominions and other countries, notably the United States, are taking similar action.

According to Rolleston the tuberculosis affliction of the workers is not spread to their wives and families, who remained peculiarly free.—G. Quinn Lennane, *J. State Med.*, 37, 10: 602–606 (Oct.), 1929.

# FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

**The Nature of the Vitamin A Constituent of Green Leaves**—The relation of the green color of plants to vitamin A stores has been pointed out by previous workers and in this experiment an effort was made to compare the potency of the lipoid extractive material from the green with the white or colorless leaves. Three to four times as much unsaponifiable matter can be extracted from a given weight of green as from white cabbage. The unsaponifiable material from the cabbage is incorporated in hardened cottonseed oil for feeding rabbits. It was found that the material from the green leaves was at least 10 times as potent in vitamin A as that obtained from the white leaves.

In attempting to concentrate the active principles, extracts of hot and cold alcohol and light petroleum were obtained and by the antimony trichloride color reactions it was determined that the most potent material was that associated with carotin in green cabbage. Carotin was prepared from cabbage, from spinach, and from carrots, and feeding experiments conducted with these concentrates. Carotin obtained from cabbage had the highest melting point and was presumably most nearly pure, and was active in a dose of 0.004 mg. per day. Carotin from spinach and carrots was not so pure and the positive dose required was 0.01 mg. per day. The residues from which carotin had been extracted were found to be inactive. The report by other workers of the inactivity of carotin in vitamin A is ascribed to the fact that fat other than that carrying the vitamin itself appears to be essential. The authors point to the accumulating evidence that

more than one substance can function as vitamin A, and the difficulty of associating the activity of highly colored crystals from plants with the pale substances derived from animal oil. It is possible that vitamin A activity may be regarded as inherent in a special grouping of atoms common to several individual molecules rather than to one definite molecule.—Dorothy L. Collison, Eleanor M. Hume, Ida Smedley-MacLean and Hannah H. Smith, *Biochem. J.*, XXIII, 4: 634, 1929.

**A Second Thermolabile Water-Soluble Accessory Factor Necessary for the Nutrition of the Rat**—The division of the vitamin B complex into the antineuritic and antipellagric factors, B<sub>1</sub> and B<sub>2</sub>, is accepted and this work indicates the probability of a third factor, tentatively termed B<sub>3</sub>. A special diet supplemented with 6 per cent marmite as the B complex source gave growth comparable to normal food. Two types of experiments are recorded, one in which the rats were fed the basal diet plus B<sub>2</sub> till constant weight was obtained for a 9-day period, then varying doses of the B<sub>1</sub> administered. These doses adjusted to pH 6.5 vary from 1/10 to 8 times the daily pigeon doses. In no case was the growth at a normal rate.

In the second type of experiment, the animals were fed at the start with the basal diet plus both B factors. In every case growth ceased or was subnormal after 4 to 5 weeks. Treated marmite retards normal growth, indicating the destruction of another factor than B<sub>1</sub> by alkaline hydrolysis of the marmite. Further experiments indicated

that the substance  $B_2$  is more thermolabile than the  $B_1$ . Discrepancies appear, the results reported here differing somewhat from facts reported by other workers, but it is pointed out that there is a possibility that the  $B_1$  reported might have contained traces of the  $B_2$  factor and that feeding experiments must be continued for 4 to 5 weeks to demonstrate the presence of this new factor.—Vera Reader, *Biochem. J.*, XXIII, 4: 689, 1929.

**Some Evidence of the Existence of a Further Factor Necessary for Growth of the Rat**—This experiment records the observations of a deficiency other than vitamin A in rats on a vitamin A-deficient diet. A vitamin A-free ration was prepared and this was irradiated in thin layers to provide ample supplies of vitamin D. This diet included a "vitamin-free casein" which was guaranteed substantially free from vitamin A. The dried yeast in the diet was also tested for vitamin B complex and it was found that 8 per cent of the yeast was sufficient for the B needs of the rat at all stages of growth.

Some of the rats on this diet failed to resume normal growth with the addition of cod liver oil, although some of the rats responded to a certain extent under such conditions. In the latter, the experiments were continued longer than the 5 to 6 weeks usually deemed necessary and these rats ceased to grow and would not resume growth with larger doses of cod liver oil, and only temporary growth resulted when the diet was supplemented with unlimited supplies of fresh watercress.

Then a product, "light-white casein," was substituted for the vitamin-free casein and rapid normal growth was resumed. However, other food substances were tested for this factor and good results were obtained with fresh milk, lettuce, fresh and dried grass clippings, ox muscle, liver and wheat em-

bryo. Milk which has been slightly heated for 15 minutes is less satisfactory, although the "light-white casein" heated in thin layers for 24 hours at  $105^\circ$  was just as potent as the unheated.

Attempts were made to extract the "light-white casein" with cold alcohol and with cold alcohol and ether. The extract was ineffective, while the casein which had been extracted was as potent as before. Hot alcohol and hot ether resulted in more active extracts and the residual casein appeared somewhat impaired. Hot 90 per cent alcohol extracted from wheat embryo the active factor almost completely. Hot ether extract is also active.

Additional experiments were conducted on the "light-white casein" to determine whether the factor could be associated with the vitamin B complex, and it was found to contain neither  $B_1$  nor  $B_2$ . The authors concluded that the factor is not vitamin E, which is not destroyed by heat as is this unknown factor. Furthermore the experimental animals indicated no shortage of vitamin E.

The authors conclude that the experiments indicate a hitherto unrecognized growth promoting factor rather than a biological inadequacy of the protein in the basal preparation.—Katherine H. Coward, Kathleen M. Key and Barbara G. E. Morgan, *Biochem. J.*, XXIII, 4: 695, 1929.

**The Number and Type of Bacteria in Commercially Prepared Infant Foods**—This investigation was initiated to learn the number and types of organisms found in various baby foods which may be commonly secured on the market and which are prepared from powdered milk. These proprietary compounds are arranged roughly in two groups, namely, those which serve as a complete nutrient for infants, and those which are "modifiers" to be added to cow's milk in various amounts



according to the requirements of the infant.

In examining the samples secured, the authors used standard nutrient agar and a specially prepared medium containing Difco tryptophane broth peptone and yeast extract. The latter medium is necessary to grow streptococci and those lactic acid producing bacteria which do not grow on ordinary standard agar.

Plates were incubated at 37° C. and 56° C. Five carbohydrate "modifiers" and one protein "modifier" were examined. It was found that these compounds contained organisms growing at 37° C. in numbers varying from 800 to 328,000 per gm. At 56° C. numbers of bacteria from 1,600 to 220,000 per gm. were found in these "modifiers."

Examinations were made of three synthetic compounds designed to offer complete foods for infants. These compounds were found to contain numbers of bacteria varying from 1,000 to 392,000 per gm. growing at 37° C. and from 1,000 to 128,000 per gm. growing at 56° C.

Six samples of dried or powdered milk and certain modifications of dried milk were examined. Bacteria, in these preparations, growing at 37° C. ranged from 10 to 112,000 per gm. and the number of bacteria growing at 56° C. varied from none to 600,000 per gm.

The predominating types of bacteria present in all samples were aerobic spore-formers capable of peptonizing milk. These bacteria were generally the *Bacillus subtilis* type although some organisms similar to *Bacillus cereus* were also present. The remaining bacteria isolated were cocci of miscellaneous types. It was found that the carbohydrate "modifiers" contained a higher percentage of thermophiles than did the protein "modifier" and the reconstituted complete foods.

It is pointed out that when the modi-

fiers are added to milk the numbers of bacteria per gm. are reduced owing to the dilution of the modifier with the milk. The actual numbers of bacteria present may not be excessive, but harmful effects may be derived from the protein split products produced by the proteolytic spore-forming organisms which constitute the predominating type of organisms in these products.

Investigation showed that there was no seasonal variation in the sanitary quality of these infant foods as indicated by numbers of bacteria, but that there are certain constant sources of contamination throughout the year.

It is suggested that all commercially prepared infant foods should be required to meet the following sanitary standards: (1) They should contain no hemolytic streptococci. (2) Twenty c.c. of sterile milk, when inoculated with 0.5 gm. of the infant food and incubated at 37° C. for 10 hours, should show no visible peptonization. (3) They should contain less than 10,000 colonies per gm. when the duplicate plates are incubated at 37° C. and 56° C. for 2 days, using the special medium containing tryptophane broth peptone, yeast, extract and glucose.—G. J. Hucker and Alice M. Hucker, N. Y. State Agric. Exper. Sta. *Tech. Bulletin No. 153* (Aug.), 1929.

**Botulism Due to Home Canned Bartlett Pears**—At Los Banos, Calif., in May, 1927, two persons, a girl of 9 and her mother, aged 27, died with typical symptoms of botulism 30 hours and 42 hours, respectively, after tasting and swallowing pieces of home canned Bartlett pears which were obviously spoiled. The toxin of *Cl. parbotulinum* was demonstrated in an enrichment culture of the gastric content of the victims obtained at autopsy.

The suspected pears were highly toxic for guinea pigs on feeding and the presence of botulism toxin type A was dem-

onstrated in the syrup. Nothing definite concerning the method of packing and sterilization could be determined, but it was established that the lid of the jar which contained the poison was bulged; the rubber ring was not tight; and the pears had an abnormal odor.

The pH of the toxic syrup was 3.86. Yeasts and lactobacilli as well as toxic and non-toxic strains of *Cl. parobotulinum* were found viable in the syrup. The m.l.d. by subcutaneous injection of the syrup for mice was 0.0005 c.c. and for guinea pigs 0.001 c.c. The thermal death time of the *Cl. parobotulinum* spores from the pears varied between 2 and 3 hours at 100° C. Examination of other samples of home canned fruit from the home of the victim showed three additional jars of pears to contain *Cl. parobotulinum* type A, identical with the organism isolated from the pears responsible for the fatalities.

By experiment it was found that the spores of *Cl. parobotulinum* isolated from the pears would resist a temperature of 100° C. for 50 minutes when these spores were suspended in raw pear juice mixed with 20 per cent syrup, the pH being 3.7. Thus, if unsound raw material carrying a mass contamination of *Cl. parobotulinum* were used, the processing time of 20 to 30 minutes at 100° C. usually followed in home canning of pears would fail to destroy the spores of the toxigenic anaerobe. The process given the toxic pears in this case was totally inadequate since yeasts and lactobacilli survived and grew.

Attempts to produce toxin experimentally in canned pears failed when pure cultures of *Cl. parobotulinum* were used. When yeasts and lactobacilli were inoculated with the botulinum organisms toxin production occurred regardless of the pH. It is concluded that the growth of the yeasts and the lactobacilli in the pears supplied the

factors which are required by the botulinum organism to germinate and to form its toxin. Pears are not subject to botulinum spoilage provided fresh and sound raw material is packed under sanitary conditions. However, a jar with a layer of mold or definite signs of fermentation may contain the deadly poison.

It is probable that certain fruits and acid vegetables owe their immunity from botulinum spoilage less to their acidity than to the absence of food substances essential to the elaboration of toxin.—K. F. Meyer and J. B. Gunnison, *J. Infect. Dis.*, 45: 135 (Aug.), 1929.

Is Irradiated Farina as Bought in the Market Enriched with Vitamin D?—This is an assay of a commercial breakfast food alleged to be "irradiated with ultra-violet rays to impart the bone-building vitamin of sunshine." Young rats between 35 and 50 gm. weight were placed on a rachitogenic diet for 18 and 21 days respectively, and at the end of that time 2 rats in each lot were killed and inorganic blood phosphorus determined and roentgenograms taken to determine the degree of rickets. The rachitic rats were kept on the test diet and compared to rats on the same diet supplemented with 2 per cent of cod liver oil, with 10 per cent of non-irradiated farina, and with 10 per cent of irradiated farina. Both farinas were bought on the open market and the 10 per cent addition was considered comparable to the amount consumed by the average child in proportion to the diet. At the end of the test periods inorganic phosphorus and ash content of femurs were determined and roentgenograms taken. The results show the rats made good gains in weight, but those on the 10 per cent irradiated farina ration showed no increase in blood phosphorus, no increase in the ash-organic residue ratio of the femurs, and X-rays show no

increased calcification in femurs. The authors conclude that the claims made for this food by its sponsors are not justified.—Frederic W. Schlutz and Mildred R. Ziegler, *J. A. M. A.*, 93: 1466 (Nov. 9), 1929.

**Whole-Meal Bread**—This is a brief summary and conclusions of the facts surrounding the use of whole wheat bread in the diet.—Liebig first extolled the virtues of whole wheat bread, and since 1868 it has been advocated both in Europe and America. Liebig believed it to be easily digested and more beneficial, due to the inorganic salts in the outer layers of the grain. Later Rubner showed that the proteins of bran were not easily digested and only partly assimilated. Researches in Germany in 1897 led to the conclusion that this bread was uneconomical for the military organization.

Since the wheat embryo is rich in vitamin B, this is used as an additional argument for whole wheat bread, but it is pointed out that this applies to wheat and not to rye, since in the latter industry the embryo separates with the meal and not with the bran. Whole wheat bread is advocated for relief of constipation and to obviate obesity.

Despite the potency of the wheat embryo in vitamin B, it is pointed out that to prove that a deficiency of this is responsible for constipation it would be necessary to conduct controlled experiments, with the only modification in the diet being between white bread and whole wheat bread.

There is cited the work of E. Mellanby, who found a constituent of oatmeal and wheat embryo which tended

to produce rickets by interfering with bone calcification. Comparing the analyses of whole wheat, white flour and bran, the conclusion is reached that white flour is a better source of energy than whole wheat. The latter contains indigestible cell membranes which in turn enclose proteins, and about 30 to 40 per cent of the material escapes digestion. Furthermore, vegetable proteins, due to the lack of amino acids, are not rated so high as animal proteins. On a white bread diet, the percentage of total food calories lost amounts to 8 as compared to 14 on a whole meal diet.

The question as to whether it is a national economy to use whole-meal bread depends on the efficiency of the milling of the by-products. It is held that the laxative effect of whole wheat bread does not differ from other laxative material and no advantage is gained compared to the use of white bread with other laxatives as needed. It is pointed out in advocating whole wheat bread that attention should be called to the fact that experiments have so far been conducted on animals and adult males. Children are intolerant of high cellulose diets and in some the whole wheat bread is definitely irritating.

Appetite is an important factor and to many the whole wheat bread is distasteful. The obvious conclusion is that caution should be exercised in advocating whole wheat bread, particularly in the case of women and children, until such time as unbiased, controlled experiments have indicated the justification for it.—Carbohydrate Content of Foods, by R. A. McCance and R. D. Lawrence, *Report of Medical Research Council*, London, 1929, p. 53.

# PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.\*

**Why More County Nurses?**—According to recent statistics country children are not so healthy as children who live in cities, and they have more physical defects. The strongest weapon to use in remedying this situation is the public health nurse. She is the missionary who can best carry the message of health into the homes and schools of America.

In one middle western state there is 1 public health nurse to every 5,092 of the urban population (that is counting the 69 industrial nurses), and 1 public health nurse to every 32,090 of the rural population, and this situation can be duplicated in any number of states.

In the *Missouri Public Health News* for November, 1929, the following reasons were given why every county in that state needs public health nurses:

1. Because 4,167 babies born last year died before they reached one year of age.
2. Because 206 young men and women died from tuberculosis last year. For every death, it is estimated that there were 10 new cases.
3. Because 406 mothers died last year from causes due to childbirth.
4. Because trachoma, a preventable disease, is the cause of blindness in one-third of Missouri's Blind Pensioners.
5. Because health examinations of Missouri school children show that 75 per cent of the children are suffering from one or more remediable physical defects.
6. Because many days of school were lost last year due to the prevalence of communicable disease. Unnecessary absentees waste the school funds.

In Missouri the average salary of a well trained public health nurse is \$1,800 a year, but this may and should

vary from \$1,500 to \$2,200 per year, depending upon the preparation of the nurse and the length of time she has been in service. In addition to salary a travel allowance of from \$35 to \$60 a month is provided when she drives her own car. Counting the expense of office space, supplies and other incidental needs, the average cost of a public health nursing service for one year is about \$2,800.—*Missouri Public Health News*, II, 46-48 (Nov.), 1929.

**A Suggestion from California**—It is not always recognized that an official public health nursing service frequently develops out of a service that an unofficial agency has fostered and supported until the people crave and demand it, and are willing to pay taxes for it. Oftener than not, too, the quality of the nursing service of the governmental agency depends upon the standard set by the unofficial agency which fostered the work in its experimental stage.

When an official agency does take over a nursing service, its responsibility for public health nursing in the community is not finished, but just begun, as the community health commissioner has a great opportunity open to him to stimulate the correlation of all the nursing services in the community. It is a pitiful sight to see a good sized city with several voluntary agencies carrying on nursing services, the nurses overlapping each other's work, sometimes not on speaking terms, and the city health commissioner perfectly satisfied because he employs a communicable disease nurse who goes into the homes to diagnose cases.

In contrast to this picture is the com-

\* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

munity whose health commissioner made arrangements to have all public health nursing agencies housed in the city hall, and was active in the amalgamation of the services. The following agencies still continued to contribute to the salaries of the nurses in this community:

The City Board of Health  
 The City Board of Education  
 The City Board of Supervisors  
 The American Red Cross  
 The State Tuberculosis Association  
 The Metropolitan Life Insurance Company

However, to assist in accomplishing this correlation there are the following practical considerations from the standpoint of the nurse in the field which were given by Helen S. Hartley, Public Health Nurse of Stockton, Calif., in a paper read before the Annual Conference of the California Health Officers League of California Municipalities in October:

1. An understanding health officer.
2. A supervising nurse to assist in interpreting policies and keeping the various activities balanced. Even where there are only two or three nurses, one should be assigned to this definite duty.
3. A central, workably good office from which and in which to work. The importance of being able to work comfortably in the office cannot be overestimated. Any person who has been rushing from one home to another, hearing the troubles of the people in her district, can not only work more happily, but can actually accomplish more work if given space at a comfortable desk with sufficient light and ventilation.
4. Coöperation fostered by those in charge of the budgets will fall like a mantle upon the staff, who will be chosen for their individual qualities rather than by any undue outside influence.

Helen S. Hartley, P.H.N., Health Office Direction and Coöperation, *Weekly Bull.*, Calif. State Dept. of Public Health, VIII, 42: 1 (Nov. 23), 1929.

**Thirty Years of Nurses at Teachers College**—The Thirtieth Anniversary of the founding of the Nursing Education Department at Teachers College, Columbia University, New York,

N. Y., was celebrated there in October by a 2-day conference, during which much honor was paid to "four of the founders" of the department. These were Mary Adelaide Nutting, Emeritus Professor of Nursing Education, whom Dean Russel characterized as the "Mother of the Nursing Education Movement"; Mrs. Helen Hartley Jenkins, who by her generous endowment made possible the Nursing Education Department of Teachers College as we know it today; Lillian D. Wald, R.N., the founder of the Henry Street Settlement Nursing Service, who led Mrs. Jenkins, through her interest in the visiting nurse, to the broader field of nursing education in general; and Dr. James E. Russel, Dean Emeritus of Teachers College, who thirty years ago dared to admit the nursing profession to the college.

The high ideals set by these four founders are being ably upheld and developed under the direction of William Fletcher Russel, the present Dean of Teachers College, and Isabel Maitland Stewart, the present Professor of the Department of Nursing Education.—The Thirtieth Anniversary of the Nursing Education Department, Teachers College, New York, *Am. J. Nurs.*, XXIX, 12: 1521 (Dec.), 1929.

**The Seattle Community Nursing Service**—The Community Nursing Service of Seattle has been reorganized as a separate community corporation after 10 years of growth under the Seattle Chapter of the American Red Cross. The objective of this service is to supply skilled nursing care on a visit basis to people in their homes, under the direction of licensed physicians.

The nursing personnel of the Seattle Community Nursing Service at present consists of 8 staff nurses, a supervising nurse and a director, but it is hoped that within the next 10 years the staff will be increased to 125 nurses. The staff

nurses are chosen from those graduate registered nurses who have excellent training school records and who have had postgraduate training in public health nursing.

The service of these nurses is available to every home in Seattle, both to those who can afford to pay for such a service and to those who can pay little or nothing at all. The organization feels that the greatest usefulness of its

service lies in bringing skilled nursing care to all families of moderate means who need only part-time nursing care in their homes and who do not want to be charity cases. The majority of this class in Seattle is the real backbone of the city life.—Seattle Community Nursing Service, *The Thermometer*, Washington State Dept. of Health, Division of Public Health Nursing and Child Hygiene, III, 2: 1 (Dec.), 1929.

## EDUCATION AND PUBLICITY

EVART G. ROUTZAHN\*

**Holiday Greetings and Appeals—**Many health house organs recognized the spirit of the holidays and some sought to express their message in terms of the season. *Alameda County Public Health News*, Oakland Public Health Center: Thanksgiving design in color. . . . *The Gleaner*, Texas Bureau of Child Hygiene: a mimeographed cover design, and a Christmas Eve poem. . . . *Missouri Public Health News*, State Board: a stock cut on first page. . . . *Alameda County Public Health News*, Oakland: colored cover design and a poem. . . . *Household Nutrition*, National Dairy Council: stock borders and ornaments and holiday helps for the housekeeper. . . . *Health Bulletin*, New Jersey Tuberculosis League: a smiling youngster on cover page presenting "Merry Christmas." . . . *Crusade Lance*, Tuberculosis Society of Detroit: a cover design with poem. . . . *Baltimore Health News*, Health Department: the A. P. H. A. holiday greeting page on the cover. . . . *Pennsylvania's Health*, State Department: editorial on "The Christmas Spirit" in

terms of health, and "Keeping Christmas Merry" with timely suggestions about toys, accidents, etc. . . . *Bulletin*, Milwaukee Department: stock ornaments and a "greeting" on the cover. . . . *News Letter*, West Virginia State Department: mimeographed sketches, and "Santa's Dream" which carried good wishes to health workers. . . . *Public Safety*, National Safety Council: green Christmas trees on cover and "It's safer to do your shopping before the rush begins." . . . *Weekly Morbidity Report*, Connecticut State Department: accompanied by a green sheet, in color, with greetings and "Aid the Light of Knowledge into the Dark Corners of Your Community to Rout Superstition, Promote Public Health, Prevent Disease and Charge with Glorious Physical Well Being Through its Radiant Energy." . . . *Bulletin*, Allentown Bureau of Health: A. P. H. A. greeting page. . . . *Hoosier Health Herald*, State Tuberculosis Association: a holiday design on cover. . . . *Editor's Clip Sheet*, National Safety Council: special Christmas material. . . . *News Release* for December 31, Illinois State Department: proposal of a "Christmas health saying

\* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

club." . . . *Better Health*, Syracuse Department: the most pleasing of all—a silhouetted child, with greetings, also inside articles on "The Best Gift of All," and "Christmas Toys." . . . *Board of Health Bulletin*, Middletown, N. Y.: mimeographed "Merry Christmas" and a Santa. . . . *Monthly Bulletin*, New Haven, Conn.: 4 pages only, special envelope and paper, all Christmas material, in three colors, with cover design including a glorified diagram showing downward infant mortality trend, and health holiday greetings to parents and to children inside . . . several bulletins used the Christmas seal in outline . . . and of course the tuberculosis groups used much Christmas material . . . and the cancer societies . . . and money appeal letters utilized the Christmas motive. *The editor would welcome additional examples* to be included in a portfolio to be shown at Fort Worth.

"Stock cuts" are ready-made half-tones supplied by printers or by several firms which make them. "Stock ornaments" are from the varied selection available to printers who use the linotype, monotype, etc. Designs for the mimeograph may be copied or adopted from many sources.

**Five Medical Societies Conduct a Joint Campaign**—November, 1929, was "Health Examination Month" in New York City, but the campaign will continue less intensively throughout 1930. The Greater New York Committee on Health Examination was formed by the five county medical societies within the city; special funds were secured; and Dr. Iago Galdston of the New York Tuberculosis and Health Association was given executive direction of the effort. Posters, folders, special meetings, addresses before ready-made audiences, radio talks, letters to ministers, mention in department store advertisements, paid advertising space

in morning newspapers, a mayor's proclamation, and an essay contest in high schools, are elements of the campaign. For samples of the printed matter address Dr. Iago Galdston, 244 Madison Ave., New York, N. Y.

**On Convention Programs**—West Virginia Public Health Association: "The Newspaper in Its Relation to Public Health," by George Anderson.

Texas Sanitarian's Short School: "Health Aspects of Public Interest," by Dr. F. L. Hoffman; "Some Methods of Projecting Intensive Health Education," by Dr. R. J. Stroud, with discussion by Dr. W. W. Peter; Milk Playlet by School Children.

**Publicity Portfolios for Conventions**—The problem: how to put up, attractively and conveniently for examination, a collection of publicity materials of varied sizes, shapes, colors, etc. The solution so far as we have worked it out is explained in a memorandum which will be sent upon request. Samples to illustrate two forms of portfolio will be loaned for 10 cents and a promise to return promptly. *Address editor of this department.* The ideas described should be useful for office or lobby display of publicity materials, or for committee examination. On this page is illustrated lettering by Merwin-Davis which will give the finishing

**rural  
sanitation**

touch to the portfolios. This lettering appeared on colored posters 3 by 6 inches as described in the memorandum mentioned above.



*This is the symbol for the tuberculosis educational campaign, with the slogan, "Protect them from tuberculosis."*



*Special pictures and leaflets for Negro groups will be illustrated with this symbol.*

**A Nation-Wide Publicity Campaign**—The spring publicity campaign of tuberculosis associations of the United States will, in April, 1930, be concerned with the childhood type of tuberculosis. Its purpose will be to tell adults responsible for the welfare of children that by the use of certain special but simple diagnostic procedures tuberculosis in its "seedling" stage, and before the appearance of symptoms, can be discovered.

The first united publicity effort of this kind was in 1928, when by means of a bludgeon blow, "*You May Have Tuberculosis*," an attempt was made to arouse the public out of its lethargy. The following year, the message was more gentle and optimistic, centering about the slogan, "*Early Discovery, Early Recovery—Let Your Doctor Decide*." The time seems right, therefore, to concentrate attention on a method of anticipating the disease in children and providing safeguards designed to prevent its development into pulmonary tuberculosis, or old-fashioned consumption.

The campaign is sponsored by the National Conference of Tuberculosis

Secretaries, under the leadership of the National Tuberculosis Association. As some of the facts about the childhood type of tuberculosis are still in controversy, much effort was expended by clinicians (called in for the purpose more than a year in advance of the campaign) so to frame the message as to be truthful and at the same time understandable and pragmatic. The subject, childhood tuberculosis, gives opportunity to revive the old story of tuberculosis prevention from a fresh aspect and to give publicity to the results of several significant research studies now under way.

Production of the materials began in the summer of 1929, and samples were in the hands of state and local associations by November. These include a brief leaflet for parents and a more extensive treatment of the subject in a 16-page illustrated booklet, bearing the title, "*Do Children Have Tuberculosis?*" designed for the intelligent parent and teacher, an illustrated manual on the diagnosis of childhood tuberculosis for physicians, a 24-sheet billboard poster, smaller posters of various sizes, lecture slides, electrotypes, and a mo-



tion picture produced by Eastman Teaching Films. The emblem or symbol of the campaign will be the portrait of an attractive child. The slogan is, "Protect Them from Tuberculosis," supplemented by:

Keep them away from sick people.  
Insist on plenty of rest.  
Train them in health habits.  
Consult the doctor regularly.

A special feature for this year will be the leaflets and posters for Negroes, which are the same as the others in text but illustrated with the head of a Negro child.

Each state will organize its own campaign, just as it does the Christmas seal sale. The National Tuberculosis Association supplements this with national publicity. The Metropolitan Life Insurance Company will again devote its usual advertising page, which reaches potentially 21 million people, to an illustrated treatise on childhood tuberculosis. Contacts will be made with national headquarters of fraternal organizations, insurance companies, women's clubs, etc. Articles and cuts will be offered house organs and trade journals, and a series of syndicated newspaper articles will be offered for release.

Last year, the National Tuberculosis Association prepared more than 6 million pieces of literature, 116 reels of motion pictures and 830 electrotypes. This was supplemented by additional material produced by state and local associations, by 1 million special leaflets prepared by John Hancock Life Insurance Company, and by other publicity features. Demands for literature from insurance and fraternal organizations greatly exceeded the ability of the National Tuberculosis Association to furnish the materials requested. No effort was spared, of course, to enlist the coöperation of health departments, schools and civic organizations.

Actual results of previous campaigns

defy exact measurement. While the amount of materials distributed, the number of lectures given, the amount of newspaper space secured, and so on, can be measured, these give no indication as to the desired end results in terms of the number of people who were persuaded to "let the doctor decide." Samplings of certain localities showed that clinic attendance and sanatorium applications were increased, and private physicians reported an increased number of patients desiring to know whether or not they might have tuberculosis. But the sum total of information conveyed or action stimulated is elusive. A device for measuring the results of an otherwise ordinary and calculated publicity campaign will probably prove to be the weakness of this effort as it was in previous ones; therefore, suggestions are eagerly invited.—H. E. Kleinschmidt, M.D.

**The President Believes in Health Education**—An extract from the health section of President Hoover's annual message to Congress, December 2, 1929:

*The organization of preventive measures and health education in its personal application is the province of public health service. Such organization should be as universal as public education. Its support is a proper burden upon the taxpayer. It cannot be organized with success, either in its sanitary or educational phases, except upon public authority. It should be based upon local and state responsibility, but I consider that the Federal Government has an obligation of contribution to the establishment of such agencies.*

**Offered to Professional Public Health Schools**—The two-session program at the Chicago A. P. H. A. meeting on "A Health Education and Publicity Program" seems to offer material of value in the teaching of public health. Reprints have been provided by the Department of Surveys and Exhibits, Russell Sage Foundation, 130 East 22d St., New York, N. Y. Copies have been of-

ferred to public health and social work training schools for free distribution to all students of public health administration or other subjects where the reprint would be useful.

The reprint includes the following: "Why Have a Plan?"—Mary Swain Routzahn; "Objectives of Publicity—On What Basis Are They Selected?"—Howard W. Green; "Audiences—How to Select and Classify Them"—Marjorie Delevan (May, 1929); "The Facts—How to Decide What Is to Be Told"—C.-E. A. Winslow; "The Approach—How to Decide on the Motives for Conduct to Which an Appeal Will Be Made"—Franklin Fearing (June, 1929)—A. J. P. H.

### A Prerequisite to Effective Publicity—

We are urged not to forget that the final test of public information is that as a result of being informed or convinced individuals act in quite specific ways. The speaker or writer who has these objectives clearly in mind is less likely to wander from the point or indulge in wordy generalizations. It seems probable that educational programs would have more vitality and a closer relation to the thinking of everyday human beings if those who planned them were fully aware of the individual responses necessary to make broad programs come true. If each effort of publicity were tested by the question "What effect should this have on the behavior of those who are exposed to it?" much writing, speaking and graphic presentation of ideas would be revised to become more simple, direct and practical in content.—

From "The Aims of Social Hygiene Publicity," by Mary Swain Routzahn, *J. Social Hyg.*, Feb., 1929.

### Diphtheria "Talkie" Trailers—

For several years the baffling problem of motion picture distribution has been met by the New York State Health Department through the use of trailers, pictures running approximately two minutes which a considerable proportion of theatre owners are willing to run in the regular programs.

This same possibility appealed to the Diphtheria Prevention Commission of the New York City Department of Health. The first production was a 300-foot "talkie" trailer in which Health Commissioner Wynne was presented delivering a talk on diphtheria of 575 words. The 50 prints were distributed from the executive offices of the theatre circuits to practically all houses in the city equipped for sound pictures.

Later four silent trailers, each about 125 feet and running a minute and a half, were put into circulation. Here are the four messages:

A message from Commissioner Wynne himself. He invites us into his office, where we watch him write it. Then we see a group of happy kiddies whom he is calling upon us to protect.

Happy, healthy children playing in the snow outside. Jolly Jack Frost comes a-jumping into the house and on the frost-flowered window pane writes an important message with an icicle point.

East side, west side, all around the town, children playing merrily excepting one little sick child who watches them from her window until her view is cut off by a timely message.

In a beautiful flower garden surrounding a pond of water-lilies (this subject is in color), we see a group of pretty children pointing to a message in the rippling water at their feet.

For a copy of the letter describing the four trailers to theatre managers and of Commissioner Wynne's talk, address the Commission at 505 Pearl St., New York, N. Y.

**Headline Producing Copy**—News releases containing material for headlines that will attract the attention of newspaper readers are illustrated in the following extracts from the output of the Illinois State Department of Public Health:

*Dec. 4:* Detecting crime among the germ population by the finger print method is now a major function of the State Department of

Health. No less than 354 examinations of this kind are done daily and 17 per cent show evidence of guilt. These facts are disclosed in the annual report of Dr. Andy Hall, State Health Director, which was handed to the Governor here this week. It showed that the laboratory, referred to as the finger print bureau, did 129,296 tests during the last fiscal year and that 22,421 incriminated numerous bacteria bent upon the destruction of people all over the state. Specimens reached the laboratory from every county in the state ranging in number from 3 for Edwards to 12,624 for Kane. . . .

*Dec. 11:* With contagious diseases now sending more than a thousand school children to bed weekly in Illinois Dr. Andy Hall, State Health Director, declared here today that absence from the classrooms is a medical rather than a disciplinary problem and recommended the employment of nurses as truant officers. Carefully kept records disclose that fully 90 per cent of absenteeism in the schools is due to illness of one sort or another and that efficient health service will reduce considerably the amount of sickness in the school population. "The six diseases of smallpox, measles, scarlet fever, whooping cough, diphtheria and chicken pox are now causing 2,000 fresh cases of illness weekly in Illinois and no less than one-half of the cases are among children of school age. All are quarantinable and cause extended absence from school. . . .

*Dec. 18:* Comparing the person who refuses or neglects to report a case of contagious disease to "hit-and-run" motor car drivers who fail to report accidents, Dr. Andy Hall, State Health Director, announced here today that a new national system of communicable disease notification is in process of organization by the federal government and that Illinois has applied for admission. Every case of communicable disease must be reported to Washington under the new system, which is a voluntary enterprise, but states where reports are seriously incomplete and delinquent will be left outside the new registration area. "Increasing travel tends to multiply enormously the opportunity of spreading contagious disease," said Dr. Hall. "As transportation facilities increase in speed and comfort this danger increases because individuals with mild attacks or in the incubation period are more apt to attempt journeys which promise quick and easy passage." . . .

*Dec. 26:* With mortality rates, barometer of winter health conditions, duplicating almost

exactly their behavior of this season last year, Dr. Andy Hall, State Health Director, expressed here today the fear that a return wave of influenza is in the making. Case reports of pneumonia which have jumped from 225 to 350 per week within a month suggest the same possibility. The tendency of influenza to travel in waves of 33-week periods makes another epidemic due in Illinois toward the end of February. "A sharp rise in the death rate at this time of year, especially if it includes a significant increase in deaths from pneumonia, suggests the possibility of influenza." . . .

The quotations above show one-third or more of each release. *Copies free.*

#### BELIEVE IT, OR NOT

Many state and local health reports have neither a table of contents nor an index!

An important city health agency report includes 91 headings—without index or table of contents—and many of the headings refer to topics not to be expected in a health report!

A few annual reports of nonofficial agencies do not carry the name of the city unless, possibly, it is buried incidentally somewhere in the text!

#### NEW PUBLICATION

After 10 or 11 years the *Railroad Man's Magazine* (280 Broadway, New York, N. Y.) has been resumed by the Munsey organization—probably an opportunity for national agencies and others with health information which should appeal to this particular audience.

#### WORDS

Every man is a dictionary, and his definition of words is ruled by his education and experiences.—From *Goblin Market* by H. de Vere Stackpoole.

When you wish to say that it is raining, say "It rains."—Credited by *Advertising and Selling* to Boileau in *L'Art Poétique*.

## BOOKS AND REPORTS

**Microbiology**—*By Benjamin Franklin Lutman. New York: McGraw-Hill, 1929. 459 pp. Price, \$4.00.*

Among the many books on microbiology written by non-medical men, this is one of the best. As long as the author sticks to his own subject, his material is excellent, but when he wanders into the domain of medicine, he is out of his element, and makes statements which are not in accordance with facts.

Some of his quotations are deplorably old. In discussing tuberculosis, for example, he gives material published in 1911, and there are a number of other references equally ancient. Just why a book of this type should consider the cure of tuberculosis is hard to understand. In discussing other diseases there is a similar lack of exactness. The discovery of diphtheria antitoxin is credited to Roux and Martin. Von Behring is not even mentioned, though he had priority in the work. Anthrax vaccine is spoken of as "serum." In the Schick Test we are told to inject "two cubic centimeters of a dilution of diphtheria toxin under the skin of the arm"—advice which is wrong from every standpoint and, if followed, might lead to severe injury or death.

The illustrations are good and abundant. The printing is good for the most part, but there seems no excuse for the misspelling of such well known proper names as Vaughan, and none for putting Koch ahead of Pasteur in credit for establishing the relation of germs to disease. If the medical discussions had been omitted, the book would be very much better. The fondness of non-medical men for discussing medical subjects is not to be com-

mended. Apart from these the book is good. A little learning is a dangerous thing. M. P. RAVENEL

**An Adventure with Children**—*By Mary H. Lewis. New York: Macmillan, 1929. 250 pp. Price, \$1.75.*

This is an adventure of a dozen or so years' duration in which the author conducted a "school" (perhaps this word has too many hidebound connotations—maybe we should say, "conducted the lives of children") according to progressive principles. Besides its interesting material the book holds one's attention because of its style and because we feel the constant influence of the author's enthusiasm.

The basic principle upon which the school was conducted, "do" rather than "don't," prevails in the writing of this book. It is the opposite of the "Uncle Tom's Cabin" or "don't" type. It makes little reference to the condition which is being met, but presents the solution.

In reading this account one can but be aware of the dynamic rôle of the leader whether it be in molding the opinion of a board of trustees, in raising money, in persuading parents to submit their children to an experiment, stimulating a group of teachers, or in dealing directly with the children. The great value of this forcefulness is apparent in the rapid development of the school. Its weakness appears in the panic of insecurity which caused the school to retrench when its leader was taken sick. So much of the personal enters into this adventure that one would not be satisfied that he understands it without knowing considerable of the life history of the author. Per-

plantation in the South, miles away from the nearest physician, has left in the mind of the reviewer a belief that a book of this kind may still serve a useful purpose. Accepting this as a fact, the work of Dr. Skrainka can be recommended. It is more sound and reliable than most of the general class to which it belongs. M. P. RAVENEL

### The Science of Nutrition Simplified.

*A Popular Introduction to Dietetics*  
—By D. D. Rosewarne, M.R.C.S.,  
L.R.C.P. St. Louis: Mosby, 1929.  
314 pp. Price, \$3.50.

In the profusion of books on nutrition this one has the distinction of being scientifically sound and free from faddism. It is a straightforward, unembellished account of modern dietary principles. No one can complain about its accuracy, but a popular book needs a little more than that to make it appealing to the lay reader. This book lacks color in its style, though not in its cover, which is a jaundiced looking affair. It is well printed, with large type on good paper, and has an index. Anyone who wants a simple and trustworthy, if not tremendously inspiring, book on nutrition will find this one of value.

JAMES A. TOBEY

### Nature Study and Health Education

—By Alice Jean Patterson. *Normal, Ill.: McKnight and McKnight. 5 Vol.* Price, \$.80–\$.96.

Health habit training is pleasingly woven into nature study in this series of school books. The first volume simplifies the problems of the teacher of the first and second grades by giving her definite lesson units. Health workers will welcome the use of these publications, for they will tend to stimulate instruction in hygiene.

Hygienists may question some of the proposals. For instance, the suggestion that the school teacher make the health examinations "in schools where there is

no nurse or physician," might lead to complications. It would seem that the same methods utilized to make nature study absorbing to the youngsters might have been used to more effect in health habit training. Tooth brush drills, health rhyme chanting, admonitions to eat spinach seem uninspiring compared to the fun to be had in keeping a balanced aquarium.

The volumes are written in appropriately simple language and printed in large type so that they can be read by the pupils of the progressive grades as class room exercises. Each succeeds in reaching the interest level of the class intended in so far as nature study is concerned. There is not an equally well planned progressive appeal to the health interest. The same ten health habits crop up each year. It would seem that by the sixth grade the children would fairly groan at the repetition of "1. Clean persons—hands, nails, face, ears"—and so on for the entire ten.

The merit of combining so effectively these two subjects, thus simplifying teaching schedules, far outweighs occasional criticisms of content, which as a whole is excellent.

RAYMOND S. PATTERSON

**Medical Leaders.** From Hippocrates to Osler—By Samuel W. Lambert, M.D., and George M. Goodwin, M.D. Indianapolis: Bobbs-Merrill, 1929. 331 pp. Ill. Price, \$5.00.

The authors have given us a readable and valuable contribution to the history of medicine. They have adopted the method of dividing history according to the various phases of development, and under these, considering some of the great figures who have had much to do with the development of the science.

The selections they have made are good as far as they go, and the facts correct. While one must naturally

grant to writers some freedom in the selection of their heroes, notable omissions open them to criticism. Auenbrugger and Laennec are justly included in the sketches, but one looks in vain for the name of Villemin, who first showed us that tuberculosis was communicable, and that the various types were all manifestations of the same pathological process. Surely he deserves a place in a book on Medical Leaders.

The weakest part of the book is that devoted to the modern period, in which there are a number of incomplete and unsatisfying statements, as well as actual errors. It is stated that Agramonte was given yellow fever by the bites of mosquitoes, and recovered. All available authorities state—what the reviewer believes of his own knowledge to be correct—that Agramonte was an immune.

The book is well printed, and can be commended to the average physician and reader who does not care to delve too deeply into medical history.

M. P. RAVENEL

**Creative Activities in Physical Education**—By Olive K. Horrigan. *New York: A. S. Barnes and Co., 1929.* 405 pp. Price, \$2.00.

This book is a timely contribution to the present trend in education to correlate various units of study in the minds of children. Physical education, which has been to many merely a means of developing the physical well-being of the child, is here made a means to an end of vivifying poetry, music, history, and manners and customs of world peoples. At the same time, the primary function of physical education is kept steadily in mind and its value emphasized because of the self expression and bodily control developed in these new avenues of its application.

The classroom teacher is kept in mind also and is given excellent mate-

rial in verse, music, and directions for dancing and games, as a basis for trying out each of the suggestions offered. In addition, very comprehensive references are given in each connection. The whole book is made attractive by clearness, practical understanding of the teacher's problems, and a delightful sympathy with a child's imagination.

LENNA L. MEANES

**Health. What Everyone Ought to Know**—By Oliver T. Osborne, M.D. *Baltimore: Charles C. Thomas, 1929.* Price, \$2.50.

This book belongs to the better class of those which have been written in such numbers during the last few years for the instruction of the public. It goes somewhat into physiology, and takes up nutrition, growth, foods, clothing, exercise, etc. The ground is well covered, and in an exceptionally clear fashion. It does not go into the treatment of disease, though general advice is given concerning first aid and simple care of some of the skin eruptions. The sections on the selection of a physician and on quackery are good.

There are a few mistakes, such as crediting the isolation of cocaine to an American chemist; and omissions, such as a discussion of alcohol, which is especially noticeable since there is a special chapter devoted to habits in which the narcotics are well handled.

The jacket gives a list of questions designed to direct the reader's attention to important subjects. There are no illustrations, but there is a very good index.

The book comes from the new publishing house of Charles C. Thomas, and its make-up deserves more than passing mention. On the page following the index, we are given the history of the printing, design of cover, name of the type and the paper. It is a delight to read a book so well gotten up.

M. P. RAVENEL

**Three Minute Medicine.** *A Series of Brief Essays on Popular Medicine—By Louis R. Efler, M.D.* Boston: Badger, 1929. 453 pp. Price, \$3.00.

This volume, which may be called "Tabloid Medicine" (no disparagement intended), is the outcome of an editorial in the *Saturday Evening Post*, which charged that while physicians were alive to the educative powers of the press, they did not know how to use it, or to express themselves in the racy English which was needed. The Toledo Academy of Medicine responded to this by appointing an Education Committee, and through its work there was created a daily medical column in the *Toledo Times* printed on the editorial page under the heading "Said by Toledo Doctors." The Academy of Medicine has thereby sponsored the material in this book.

Some 200 subjects are considered, running all the way from short biographies of the fathers of medicine down to halitosis. Some 25 papers give "Anecdotes and Curiosities." The articles average about 400 words.

The book is eminently entertaining, and the facts in the main are sound, though the ideas expressed in some of the articles, "Ptomaine Poisoning," for example, are out of date and incomplete. The truth is told about medical fads and superstitions. Controversial matters, such as credit for the discovery of ether anesthesia, are fairly stated. This interesting experiment we judge has been entirely successful so far, and we wish it could be extended to every city in the United States. The printing and make-up of the book are excellent, the paper light, and we hope for it a large circulation. Even doctors will find many interesting anecdotes unknown to many.

M. P. RAVENEL

**Pathogenic Microorganisms.** *A Practical Manual for Students, Physicians, and Health Officers—By William H. Park, M.D., Anna W. Williams, M.D., and Charles Krumwiede, M.D.* (9th ed. rev.). Philadelphia: Lea and Febiger, 1929. 819 pp. Price, \$6.50.

A book which has gone through nine editions has proved its value. In the present instance the authors have continued to add new material as it became available, bringing the text up to date.

In the sixth edition the practical application of serums and vaccines was transferred to a special section, known as Part III. In the present edition the earlier arrangement, which placed the practical application of our knowledge under the individual diseases, has been returned to, which, in our judgment, is a distinct improvement.

The new work on streptococci, yellow fever, and other subjects has been included, and there is a section on the use of BCG by the mouth in the immunization of children against tuberculosis. The newer precipitin tests are also included and discussed.

There are some peculiar statements, as on page 696, where we are told that the *Aedes aegypti* (properly *aegypti*) has been found as far north as Charleston, S. C. As it has been abundantly proved that in this country, at least, this mosquito is the only means by which the disease is transmitted, one cannot help wondering as to the origin of the epidemics in Wilmington, Norfolk, and even Philadelphia.

The book is well printed and put together, though there are still some errors in the index and elsewhere. Altogether we consider it the most useful single volume for students. M. P. RAVENEL

# HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

**Nebraska**—The object of Nebraska's recently organized Public Health Association is to "protect and promote public health by the closer correlation of all health activities, fostering and supporting constructive legislation, and aiding in the dissemination of correct information with regard to public health." The work of the State Bureau of Health is organized under four divisions: vital statistics, child hygiene, venereal diseases, and laboratories—each with its own director.

Heart disease with 1,840 deaths leads the list of causes of death, with cerebral hemorrhage and apoplexy (1,266) and cancer, all forms (1,257), following.

One of several amendments to the vital statistics statute by the 1927 Legislature authorizes the State Department of Public Welfare to make a charge of 50 cents for a certified copy of the record of a birth, death, marriage or divorce. At the request of any parent or guardian a certificate giving information relative to parentage and date of birth is furnished free of charge for school purposes or for securing employment.

Health schools for women were held in 36 communities, giving 4 lessons each in prenatal, infant and child care, and in prevention and control of disease. Eighteen groups of high school girls received instruction in 4 lessons on infant and child care. Lesson outlines and bulletins added value to this instruction. During the biennium there were 156 Child Health Conferences, in which 5,514 children were given a complete physical examination, with 13,094 remediable defects found. A total sum of \$221,635.99 was paid in mothers' pensions by 89 of the 93 counties in the state during 1927. This money was

distributed among 1,173 mothers and involved 3,322 children.

At the request of the secretary of the Department of Public Welfare, a 3-month survey was made to show the needs of juvenile court and probation development, especially in the rural counties of the state, and to stimulate local interest in the extension of these agencies. A recommendation for County Welfare Boards, with one trained worker in the smaller counties, seems the only way to obtain satisfactory probation service and to cover other important welfare needs. An educational campaign, to be carried on by the Child Welfare Division of the State Department of Public Welfare, is suggested to impress upon the respective communities the responsibility which they have toward their youth and their families who need help.

**Readable Reports**—No longer are annual health department reports confined to mere tabulations of births, deaths, marriages, and a statistical record of accomplishments during the year, with but meager, if any, interpretive comments upon the material presented. With communities becoming more and more health-minded, health officers have adopted modern publicity methods in report writing and are finding their clear and business like reports in great demand.

Graphic and pictorial presentation of the development of activities and the trend of mortality rates become effective tools by which the health officer acquaints the public with happenings in the field of public health. "Palo Alto Public Health Milestones" aptly illustrates the newer method of charting the growth of health work in a city. Any



number of interesting variations of this method might be worked out by health administrators and used advantageously in an annual report or other health education publications.

Health education is relatively new as a recognized health department activity, and the annual report offers an excellent opportunity for community education concerning the work of the department as a whole.

Analyzing health facts and discussing them in language that can be readily understood by the layman as well as the professional, now becomes a necessity. Business groups, keenly alive to the economics of public health work, and seeking convincing evidence of progress in the reduction of death rates from preventable causes, are impressed with diagrams showing the decline in typhoid deaths after the installation of a safe water supply or the adoption of a sound milk ordinance. Similarly, the value of diphtheria immunization work becomes an established fact upon the presentation of charts showing the death rate from diphtheria before and after immunization campaigns began.

The 1928 annual report of "Public Health in Cattaraugus County, N. Y." is one of several excellent examples of a "readable report." Well printed, with sufficient illustrations and diagrams, with just the proper amount of tabular material and with chapter headings and sub-headings that have a popular appeal, this report serves the purpose of education as well as a chronicle of activities and accomplishments during 1928. Its style deserves imitation.

Illustration used in the 1927 Palo Alto Annual Health Department Report, and reprinted in *Health Officers' News Letter*, A. P. H. A., 4, 11 (Nov. 22), 1929.

Cattaraugus County, N. Y.—The roll of honor of health reports for 1928 will include that of Cattaraugus County.

The report is characterized by careful preparation and editing, excellent arrangement, with headings and sub-headings, good printing in readable type, attractive illustrations, with charts, graphs, and photographs accompanied by interesting descriptive text.

There are 3 distinct autonomous groups together representing a coöperative county effort to promote public health work. These groups include the official county department of health, including local health officers; the official county agency for health supervision of school children; and the local voluntary health agencies in various parts of the county. There are 73 physicians and 36 dentists for an estimated population of 72,851.

Bureaus that have functioned within the county unit as a part of the health department include the Bureau of Tuberculosis, with a medical director; the county laboratory, with a medical director, 3 technicians and 2 laboratory workers; the Bureau of Public Health Nursing, with a director, an educational director, a social service consultant and 14 staff nurses; and the Bureau of Maternal, Infant and Child Hygiene, with a medical director. The Bureau of Statistics has a statistician in charge. In addition, there were 6 stenographers and clerks and a sanitary inspector on the staff, beside the full-time medical health officer. The budget for the year amounted to \$108,000, of which \$56,000 was from county and state funds and \$52,000 from the Milbank Memorial Fund.

This county reports a birth rate of 18.5, about one-third of the births occurring in hospitals. A death rate of 13.8 and an infant mortality rate of 70 are recorded. Of 97 infant deaths, 68 occurred before the infant was a month old. There were 21 cases of diphtheria, with 1 death. The parents of the family where the fatal case occurred had been urged by the public health nurse to

have toxin-antitoxin for the children, but, as in so many cases, the matter had been put off because diphtheria was not present at the time. There were 35 deaths from tuberculosis during the year, giving a specific rate of 47 as compared with a rate of 76 in 1918.

Health education, according to the report, is effectively extended from neighbor to neighbor as a result of personal contact with some branch of the county health service, as well as by more formal means. Members of the staff gave 135 addresses to groups numbering 5,600 people, while newspapers published over 8,700 health articles.

**Milwaukee, Wis.**—One of the 10 chapters of the 1928 report of municipal government and activities of the City of Milwaukee deals with public health. This city of approximately 550,000 people reports a birth rate of 22.3 per 1,000 population, a death rate of 10.9, and an infant mortality rate of 70 per 1,000 living births. Of the 846 infant deaths during the year, 477 or over one-half occurred during the first 30 days of life. To decrease this infant mortality rate it is suggested that a more intensive prenatal program be put into effect.

Several new full-time positions were created during the year. Milwaukee now employs a full-time director of health education who develops the publicity and educational work through the four divisions of news material, lectures, publications, and exhibits. Other full-time positions include the home nursing instructor, the nutrition instructor, and the instructor in social hygiene. The budget of the health department, apart from the amount appropriated for the maintenance of South View hospital, allows 90 cents per capita for preventive health work.

One of the most gratifying accomplishments in the health field in Milwaukee during 1928 was the reduction in both diphtheria case and death rates

from 757 cases with 56 deaths for 1927 to 382 cases with 35 deaths in 1928. On the other hand, epidemics of influenza and pneumonia were more serious in this city during 1928 than any year since 1918.

A total of 29,756 visits, of which 758 were school children and 17,197 well babies, was made at the child welfare clinics during the year, as compared with 25,679 in 1927. In these clinics, toxin-antitoxin was administered to 3,532 children; while 788 were vaccinated, and 2,165 had complete physical examinations. Physical examinations of 62,011 school children were made by school physicians. Defects found numbered 55,976 and 22,556 corrections of these defects were recommended. The nurses of the child welfare division made 56,979 child welfare calls during the year; of these, 13,335 were upon preschool children. Preschool activities advanced greatly during 1928, when 4,304 preschool children visited the clinics, an increase of 1,295 over last year.

R. E. W.

**Los Angeles, Calif.**—The health officer's report for the year ending June 30, 1929, contains a table of contents at the front and an alphabetical index at the back. The following significant statements appear in a letter of transmittal.

The effectiveness of the health officer's work is increased or diminished by the attitude, knowledge and sympathies of his Board of Commissioners. It is essential that health commissioners be men of broad human sympathy with a real interest in the problems of the wage earner and the poor. They must be men who understand and believe thoroughly in the principles and practices of public health as taught and laid down by the American Public Health Association and the U. S. Public Health Service, for it is according to these principles and regulations that the health officer must work.

This city of an estimated population of 1,350,000 reports an average death rate for the last 5 years of 10.47 and an

the normally healthy child from the ailing one, stimulate the question of what constitutes "normal" health.

FORDYCE, A. D. Borderline Problems in Childhood. *Brit. M. J.*, 3591: 791 (Nov. 2), 1929.

**Iodine as an Influenza Prophylactic**—Twenty-three schools in which the children were given iodine "blocks" were closed a total of 73 days. Twenty-three control schools (in which the children got no iodine) were closed for 155 days on account of epidemic sickness, usually influenza. Write your own annotation.

FRASER, K. Effect of Iodine in Reducing Loss of School Attendance from Epidemic Sickness. *Med. Off.*, 42, 22: 242 (Nov. 30), 1929.

**Infectivity of Chicken Pox**—Chicken pox apparently is infectious for not more than 24 hours preceding the eruption, and probably ceases within 10 days. Convalescent serum affords a high degree of protection.

GORDON, J. E., and MEADER, F. M. The Period of Infectivity and Serum Prevention of Chicken Pox. *J. A. M. A.*, 93, 26: 2013 (Dec. 28), 1929.

**Washing Water Filters**—The results of washing rapid sand filters with varying velocities of wash water are studied, and a formula is suggested to determine efficient washing rates.

HULBERT, R., and HERRING, F. W. Studies on the Washing of Rapid Filters. *J. Am. Water Works Assn.*, 21, 11: 1445 (Nov.), 1929.

**Convalescent Serum**—Evidence of the rôle of convalescent serum in the prevention of measles after exposure and in preventing paralysis in poliomyelitis is subjected to a critical review. The prophylactic value of measles serum seems assured, but the case for poliomyelitis serum is more difficult to establish.

KELLOGG, W. H. The Present Status of Con-

valescent Serum Therapy. *J. A. M. A.*, 93, 25: 1927 (Dec. 21), 1929.

**Rural Influenza Studies**—An outbreak of influenza in two isolated communities gave a unique opportunity for an epidemiologic study. The incubation period was usually 2-3 days. Nearly half the families in one town contracted the disease.

KRAMER, S. D. A Study of an Influenza Epidemic in Two Small Isolated Towns. *J. Prev. Med.*, 3, 6: 433 (Nov.), 1929.

**Rural Health Work**—Enlightening indeed to complaisant provincials is this detailed report of the extent of rural health administration in which the U. S. Public Health Service coöperates.

LUMSDEN, L. L. Coöperative Rural Health Work of the U. S. Public Health Service in the Fiscal Year 1929. *Pub. Health Rep.*, 44, 49: 2983 (Dec. 6), 1929.

**Cell Biochemistry**—This paper appears to be a very profound dissertation on the biochemistry of the cells and tissue. Undoubtedly it will prove intensely stimulating to readers of the *JOURNAL* who may be at home in biochemistry. To others it is so much Greek.

PETERS, R. A. Coördinate Biochemistry of the Cell and Tissues. *J. State Med.*, 37, 12: 683 (Dec.), 1929.

**Hypertension in Relation to Age and Sex**—As a sudden rise in the incidence of hypertension occurs at the time in each sex which coincides with the age at which involution of the glands of internal secretion begins, this fact seems significant.

RISEMAN, J. E. F., and WEISS, S. The Age and Sex Incidence of Arterial Hypertension. *Am. Heart J.*, 5, 2: 172 (Dec.), 1929.

**Height and Weight in Negro Children**—The variation in the height-weight-age relationships in white and negro children is set forth in tables com-

piled from a very large number of measurements.

ROYSTER, L. T., and HULVEY, C. N. The Relations of Weight, Height and Age in Negro Children. *Am. J. Dis. Child.*, 38, 6: 1222 (Dec.), 1929.

**Tuberculin Skin Reactions**—Less than half as many children in America today give a positive response to the intracutaneous injection of tuberculin as did the children in the series of published European studies. This makes the tuberculin reaction the more important, and it should be applied to every child who is underweight, anemic, languid.

SMITH, C. H. Tuberculin Skin Reactions. *Am. J. Dis. Child.*, 38, 6: 1137 (Dec.), 1929.

**Milk Regulations**—That the courts continue to be liberal in upholding all reasonable regulation of milk production by the constituted health authorities is the conclusion of this brief review.

TOBEY, J. A. The Legal Phases of Milk Control. *Pub. Health Rep.*, 44, 51: 3110 (Dec. 20), 1929.

**Open-Air Schools**—Attractively illustrated, this architect's description of the Derbyshire (England) open-air elementary schools will prove exceedingly valuable to American sanitarians concerned with this special health project.

WIDDOWS, G. H. The Derbyshire Open-Air School. *Med. Off.*, 42, 22: 241 (Nov. 30), 1929.

## BOOKS RECEIVED

ANNALS OF THE PICKETT-THOMSON RESEARCH LABORATORY. Vol. V. Published by the Pickett-Thomson Research Laboratory, St. Paul's Hospital, Endell St., London, W. C. 2, England. Williams & Wilkins, Distributors, 1929. 392 pp. Price, \$10.00.

A BOOK OF CRIMES. By A. S. MacNalty. London: Elkin, Mathews and Marrot, 1929. 328 pp. Price, \$3.50.

THE VISITING TEACHER AT WORK. By Jane F. Culbert. New York: Commonwealth Fund Division of Publications, 1929. 235 pp. Price, \$1.50.

MENTAL HYGIENE AND SOCIAL WORK. By Porter R. Lee and Marion E. Kenworthy. New York: Commonwealth Fund Division of Publications, 1929. 309 pp. Price, \$1.50.

THE MEDICAL MUSEUM BASED ON A NEW SYSTEM OF VISUAL TEACHING. By S. H. Daukes. (3d ed.) London: The Wellcome Bureau of Scientific Research, 1929. 183 pp.

BACTERIOLOGY FOR NURSES. By Harry W. Carey. Philadelphia: Davis Company, 1930. 282 pp. Price, \$2.25.

VALUES AND METHODS IN HEALTH EDUCATION. By Walter Frank Cobb. Evanston: Row, Peterson & Co., 1929. 362 pp. Price, \$2.00.

THE IMMUNOLOGY OF PARASITIC INFECTIONS. By William H. Taliaferro. New York: Century Co., 1929. 414 pp. Price, \$6.00.

SALVAGING OLD AGE. By Lillian J. Martin and Clare de Gruchy. New York: Macmillan, 1930. 173 pp. Price, \$2.00.

EXPERIMENTS IN HEALTH. By J. Mace Andrews and Maud A. Brown. New York: Ginn, 1929. 208 pp. Price, \$48.

THE PSYCHOLOGY OF LEARNING APPLIED TO HEALTH EDUCATION THROUGH BIOLOGY. By Anita Duncan Laton. New York: Teachers College, 1929. 103 pp. Price, \$1.50.

ULTRAVIOLET LIGHT AND VITAMIN D IN NUTRITION. By Katharine Blunt and Ruth Cowan. Chicago: University of Chicago Press, 1930. 229 pp. Price, \$2.50.

HEALTHFUL LIVING. THE WHY AND HOW. By S. E. Bilik. New York: Scribners, 1929. 261 pp. Price, \$2.50.

EDUCATIONAL OBJECTIVES OF PHYSICAL ACTIVITY. By Frederick Rand Rogers. New York: Barnes, 1929. 109 pp. Price, \$1.00.

THE DEEPER MEANING OF PHYSICAL EDUCATION. By Eugen Matthias. New York: Barnes, 1929. 88 pp. Price, \$1.00.

THE ROAD TO HEALTH. By John P. Koehler. Milwaukee: Health Department, 1929. 85 pp.

LEHMANN'S MEDICAL HAND ATLASES. Vol. X/1. Lehmann-Neumann-Breed. Determinative Bacteriology. English Translation. 7th German edition. Vol. I: Atlas. New York: Stechert, 1929. 170 pp.

# NEWS FROM THE FIELD

## WEST VIRGINIA PUBLIC HEALTH ASSOCIATION

THE following are among the resolutions passed by the West Virginia Public Health Association, at its meeting in Morgantown, W. Va., November 26, 1929.

RESOLVED that an intensive effort be made to secure an increase in the annual appropriation made by the State Legislature for the State Health Department in order that the department may be enabled to extend its activities to a greater extent throughout the state, and be it further

RESOLVED that the necessity for an increase be brought to the attention of the County Courts of the state and also to the State Budget Commission, as outlined in our president's address.

RESOLVED that there be a continued effort made to standardize the methods of administration of public health work and looking toward securing a more permanent tenure of office for health officials.

RESOLVED that the West Virginia Public Health Association secure from the other state associations affiliated with the American Public Health Association an expression of opinion regarding the advisability of requesting the American Public Health Association to provide some channel through which the papers presented at the meetings of the various state associations may be published, so that they may be made available to the members of all affiliated public health associations.

## NEW JERSEY PUBLIC HEALTH AND SANITARY ASSOCIATION

THE Fifty-fifth Annual Meeting of the New Jersey Public Health and Sanitary Association was held on December 6 and 7 in Asbury Park, N. J.

The following officers were elected for the ensuing year: D. C. Bowen, Asbury Park, President; Samuel B. English, Glen Gardner, First Vice-President; Samuel L. Salasin, M.D., Atlantic City, Second Vice-President; F. J. Osborne,

Health Officer, East Orange, Third Vice-President; Edward Guion, M.D., Atlantic City, Secretary; H. B. Baldwin, East Orange, Treasurer; James E. Brooks, C.E., Glen Ridge, Chairman of the Executive Council; Carl T. Pomeroy, Montclair; Mrs. Lenore Y. Wiley, East Orange; I. W. Knight, Pitman; A. S. Fell, M.D., Trenton, and William B. Palmer, East Orange, were added to the Council. Representative to the American Public Health Association, Edward Guion, M.D., Atlantic City, and B. H. Obert, Asbury Park, alternate.

This society is now regularly incorporated under the laws of New Jersey.

## CHILDREN'S BUREAUS, GERMANY

THE first statistical review of the activities of the official children's bureaus of Germany has been recently published.

A national system of children's bureaus was established in Germany by legislation which was enacted in 1922 but which did not come into effect until 1924. The bureaus supervise children placed outside their homes, hold the guardianship of children born out of wedlock, administer public aid to dependent minors, supervise neglected children, and share in probation work and in the enforcement of child labor laws. A recent statistical report of the work of the bureaus shows that on March 31, 1928, there were more than 1,200 children's bureaus in Germany outside Saxony, where this work is carried on by public relief agencies. On that date the bureaus had under supervision more than 544,000 children under 14 years of age in foster homes and were serving as legal guardians of 560,000 children, most of whom were

born out of wedlock. Special supervision was being exercised over 66,000 children who though living with their parents were in danger of becoming neglected or delinquent. The bureaus were also doing probation work with 48,000 juvenile delinquents, in most cases in coöperation with private probation agencies.

#### S. CHANNING CHILD HOSPITAL OPENED IN VIENNA

THE gratitude of a retired New Jersey business man, who was cured 3 years ago by Dr. Adolf Edelmann, is responsible for the opening of a new important world hospital for cancer and internal diseases in Vienna. It will be known as the S. Channing Child Hospital and Research Institute and will occupy the building of the famous private clinic "Pelikangasse." The new institute is placed under the direction of Dr. Edelmann. There will be many free beds.

The hospital will have the latest radium and biological laboratories and a staff of 30 research physicians. Dr. Edelmann has been a research worker in Vienna for 18 years and, like Mme. Curie, is of Polish birth.

#### CONGRESS FOR SEX RESEARCH

THE Second International Congress for Sex Research will be held in the House of the British Medical Association, Tavistock Square, London, August 3-9, 1930, under the presidency of Professor F. A. E. Crew, of Edinburgh. Both in membership and in importance it is expected that this meeting will notably excel the First Congress, held in Berlin in October, 1926. Those who are interested are requested to write Professor Crew, The University, West Mains Road, Edinburgh.

The organization and purposes of the Congress can be fully served only by having all of the many aspects of sex

research properly represented among the papers read at the London meeting. To American workers it is highly desirable that American investigations and investigators should be adequately represented at London—particularly since few from this country attended the First Congress.

An American committee has been formed for the purpose of securing a maximum participation in the Congress by workers in this country. The members of this committee, representing biology, medicine, psychology, sociology and anthropology, are: Dr. Oscar Riddle, Chairman, Dr. A. A. Brill, Dr. Calvin P. Stone, Dr. William F. Ogburn and Dr. Clark Wissler.

#### HARVEY W. WILEY RESIGNS

ON January 1, 1930, Dr. Wiley became Director-emeritus of the *Good Housekeeping* Bureau of Foods, Sanitation and Health. Dr. Wiley has been connected with this service since 1912, and resigns because of his great age—83. The Bureau was created for him so he might wage war upon impure foods. He was formerly chief of the U. S. Bureau of Chemistry, which in 1928 was abolished and supplanted by the Bureau of Soils and Chemistry.

#### TEXAS ASSOCIATION OF SANITARIANS

IN convention assembled at Edinburg, Tex., December 5, 1929, the Texas Association of Sanitarians selected the following new officers for the ensuing year, 1930: President, Dr. H. K. Read, Houston; First Vice President, H. W. Van Hovenberg, Texarkana; Second Vice President, Dr. Y. J. Aiken, Lubbock; Third Vice President, C. N. Shepherdson, College Station; Fourth Vice President, Marguerite Cunningham, Fort Worth; Secretary, E. G. Eggert, Austin. Dr. H. K. Read, the new President, is Supervisor of Hygienics in the public schools of Houston.

It was unanimously decided to hold the 1930 annual short school at Amarillo the first part of September and also hold the business session jointly with the American Public Health Association convention, with which the Texas Association is affiliated, at Fort Worth the last week in October.

Approximately 250 were registered for the meeting and declared this one of the best sessions ever held. Dr. J. R. Mahone is the retiring president.

Some of the resolutions passed were as follows:

WHEREAS, the activities of the State Board of Health and the staff of the State Department of Health have been of great benefit to the state in the prevention of sickness; and

WHEREAS, they have labored diligently during the sessions of this school for the advancement of sanitation in Texas, especially in connection with the standard milk sanitation program, mosquito control, and in water and sewage purification; therefore be it RESOLVED, that this Association endorse their activities, and further, that steps be taken to bring these accomplishments to the attention of the next Legislature with the request that more adequate appropriations be made for the support of an ample health program for the State of Texas.

WHEREAS, the Republic of Mexico, through its Public Health Service, has been so gracious as to have a representative attend and participate in our sessions in person of Dr. Toribio Gracia; and

WHEREAS, this visit has been instrumental in furthering friendly relations and a closer understanding in health matters; and

WHEREAS, the ground work has been laid through this visit for a joint international health meeting in connection with the American Public Health Association convention in 1930 at Fort Worth, with the possibility of a side trip excursion to Mexico City; therefore be it

RESOLVED, that this Association express its thanks to the government officials of Mexico and especially Dr. Toribio Gracia for his contributions and his visit.

WHEREAS, the American Public Health Association, in convention assembled in Minneapolis in October, 1929, selected Fort Worth, Texas, for the 1930 annual convention place; and

WHEREAS, this decision was made at the urgent request of the combined efforts of various Texas groups, including the Association of Sanitarians; therefore be it

RESOLVED, that this Association officially go on record here as pledging its full support and coöperation in making the 1930 convention a memorable success.

#### POPULAR SCIENCE MONTHLY PRIZE

AN annual award of \$10,000 and a gold medal for outstanding scientific achievement, to be made first in September, 1930, has been established by *Popular Science Monthly*. A committee composed of 24 scientists will select the first winner from among those who accomplish outstanding work in the year ending June 30, 1930.

This award was created "to heighten the interest of the American people in those conquests of the laboratory and the workshop which benefit the entire community."

#### NOBEL PRIZE IN MEDICINE

THE Caroline Institute of Stockholm, Sweden, announced that the Nobel Prize in medicine for 1929 has been awarded to Dr. C. Eijkmann of the University of Utrecht, Holland, jointly with Frederick Gowland Hopkins, professor of biochemistry at the University of Cambridge, England. This prize was awarded to them for their excellent work on vitamins.

#### THE FIRST INTERNATIONAL CONGRESS ON MENTAL HYGIENE

THE First International Congress on Mental Hygiene will be held in Washington, D. C., May 5-10, 1930, with headquarters at the Hotel Willard. President Hoover is Honorary President of the Congress. The American Psychiatric Association and the American Association for the Study of the Feeble-minded will hold their Annual Meetings in conjunction with the Congress.

The *Proceedings* containing papers delivered will be available by applica-

tion to John R. Shillady, Administrative Secretary, 370 Seventh Avenue, New York, N. Y.

Clifford W. Beers of the National Committee for Mental Hygiene is Secretary General of the Congress. Mr. Beers's book *The Mind That Found Itself* is now in its 15th edition.

#### AUSTRIAN HEALTH DEMONSTRATIONS

THE health demonstrations which have been conducted in Austria during the past five years by the Commonwealth Fund have been concluded. Among the permanent results are more than 80 child-health centers, located in every Province of Austria and enrolling more than 42,000 mothers and children,

which will be continued under the supervision of a national administrative committee with government appropriations to take the place of Commonwealth Fund support. A large proportion of the money expended in Austria was used in providing educational opportunities for physicians and health workers occupying strategic positions and in grants to the institutions and activities best able to contribute to further strengthening the public health program.

#### NEW MEXICO

THE state of New Mexico has been admitted to the U. S. Birth and Death Registration Areas for the year 1929.

## PERSONALS

W. C. SIEKER, principal of the Milwaukee Vocational School, Milwaukee, Wis., died on December 2, 1929. Mr. Sieker is a member of the American Public Health Association.

B. L. ARMS, M.D., formerly state health commissioner of Florida, is now county health officer of Idaho Falls, Ida. Dr. Arms is a Fellow of the A. P. H. A.

JAMES C. HARDING, JR., is now associated with Barker & Wheeler, an engineering concern of New York, N. Y.

DR. L. G. BEAN has been appointed as Chief of the new Bureau of Dental Hygiene of the State Department of Health of Ohio.

DR. J. A. FRANK, Chief of the Division of Hygiene, State Department of Health, Ohio, died on December 5.

DR. CLARENCE FLOYD HAVILAND died of pneumonia in Cairo, Egypt. He was the Superintendent of the Manhattan State Hospital for the Insane on Wards Island, New York.

DR. FRED L. ADAIR has accepted the chair of gynecology and obstetrics at the University of Chicago Medical School. Dr. Adair was formerly with the University of Minnesota Medical School.

C. ST. CLAIR DRAKE, M.D., formerly Associate Field Director of the Committee on Administrative Practice of the American Public Health Association, is now Managing Officer of Jacksonville State Hospital, Jacksonville, Ill.

#### CONFERENCES

Feb. 18, American Conference on Hospital Service, Chicago, Ill.

May 5-10, First International Congress on Mental Hygiene, Washington, D. C.

June 6-14, National Conference of Social Work, Boston, Mass.

#### FOREIGN

May 19-21, Second International Malaria Congress, Algiers, Algeria

June 4-9, Congress of Royal Institute of Public Health, Portsmouth, England

June 21-28, Royal Sanitary Institute, 41st Congress and Health Exhibition, Margate, England

Aug. 3-9, Second International Congress for Sex Research. London, England



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## RECENT PUBLICATIONS

### The Diagnosis of Health.

*William R. P. Emerson* \$3.00

### Synopsis of the Practice of Preventive Medicine.

*Shields Warren, Editor* \$2.50

### Psychology of Learning Applied to Health Education Through Biology.

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### The Immunology of Parasitic Infections.

*William H. Taliaferro* \$6.00

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# American Journal of Public Health

## and THE NATION'S HEALTH Vol. XII No. 3

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Volume XX

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## Some Special Problems in Atmospheric Pollution\*

ABEL WOLMAN, F. A. P. H. A.

*Chief Engineer, Maryland State Department of Health, Baltimore, Md.*

ONLY a few of the evils attendant upon our industrial evolution and urbanization of life are discussed in this paper. The problems selected are chosen as typifying some of the objectionable features of atmospheric adulteration which have confronted our department in recent years. The examples cited are illustrative only. They may be multiplied in many directions. Aside from their technical implications, their significance in relation to current administrative health practice and to the important question of public attitudes is briefly commented upon.

### CARBON MONOXIDE HAZARDS IN THE STEEL INDUSTRY

As a basic industry of the modern world, perhaps none surpasses the manufacture of steel, either in the application of its product or in the employment of workers. As one of the oldest industries, it also brings with it complicated problems of hygiene in many instances unrecognized or at least inadequately understood. One of these lies in the control of the detrimental effect upon exposed operators of carbon monoxide pollution of the atmosphere.

As an illustration of the hazard involved, the conditions at a single steel plant are briefly presented. At this plant, 6 blast furnaces are available, 5 of which are used continuously. Each is charged with 450 tons of coal and produces daily about 160,000 cu. ft. of gas, which is collected from the tops of the furnaces by means of 4 take-down pipes, discharging into a dust separator where the large particles of

\* Read at a Joint Session of the Laboratory and Public Health Engineering Sections of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 3, 1929.

coke and coal are removed by gravity. From these the gases are passed into a washing chamber where the finer particles of suspended matter are removed. After drying in rotary driers, a portion of the gases is utilized to operate the steam boilers. The rest passes directly to the engine room to be utilized in Bethlehem internal combustion engines. There are 6 twin engines, each driving electric generators having a rated capacity of 400 kw. The exhausts discharge through water seals into a main header, from which the exhaust gases pass by way of a tunnel to a 100-foot stack discharging into the atmosphere. At the time of our investigations 10 men were employed around these engines. They were required to inspect the gas seals in the cellar under the engines about four times a day. This cellar was poorly ventilated and men consigned to this work were gassed from time to time, due presumably to leaks at the gas seals or in the main header. Most of the gas poisonings occurred in these gas engine works.

At the coke oven unit of the works an average of about 320 men is regularly employed. These ovens are charged from the top every 8 minutes. Gases from this unit are conducted to a recovery plant where ammonia, tar, naphthalein, oil and other by-products are removed. After this treatment the gas is passed to Baltimore for use. Records of the company show only 3 cases of gas poisoning at this unit in the 8 years preceding. These coke oven furnaces are not housed, and employees are in the open at all times.

Gas passed on to Baltimore is pumped by 8 Ingersoll Rand electric drive booster pumps. Three men work in 8-hour shifts each at this plant, with an extra man during the daylight shift. No cases of gas poisoning have ever been reported from this unit.

The whole plant was supplied with a great number of Burrell, McCay and Gibbs, and other makes of gas masks. Oxygen tanks for artificial respiration were located at various stations about the works. Each year 20 or more men were given a 2 weeks' course of instruction in artificial respiration methods and other work of this sort by a representative from the U. S. Bureau of Mines.

A record of gas poisoning cases in the year 1926 is shown in Tables I and II. A total of 337 cases occurred in a little over 9 months. A large majority of these were termed "gas headaches" by the corporation physician. This indicated that the employee had applied at the dispensary for treatment for headache caused presumably by carbon monoxide poisoning. Other cases were termed "gas exhaustion" and were of a more serious nature. Most of these were brought to the dispensary by ambulance and many required treatment with oxygen. Some were incapacitated for a few hours, others for several days.

TABLE I  
CASES OF "GAS HEADACHES" REPORTED IN A STEEL PLANT

Date 1926	Total Cases	Number of Cases of Varying Intensity			
		Ambulance	Bed	Oxygen	Miscellaneous
January	36	6	4	1	1 2d stage
February	48	11	10		1 1 week
March	48	8	10		
April	18	2			
May	22	4	4		
June	17	2	1		
July	25	5	4		1 4 days
August	36	2	3		
September	25	8	4	1	1 1 day
October	3				

The majority of these cases of carbon monoxide poisoning occurred at the gas engine unit in the basement below the operating floor. Intensive surveys at this unit revealed faulty water seals, leaks in the gas exhaust main, and other mechanical defects which would occur from time to time in the engine proper. Repair work in these connections was responsible for numerous cases of so-called gas exhaustion of a serious nature. Several deaths resulted during repairs to the gas collection main. In all instances, according to the superintendent, the men who died were equipped with masks which apparently failed to protect under the existing concentration. Steps were immediately taken to correct faulty gas seals, to repair gas engines, and to redesign certain portions of the equipment. Windows near the roof of the building were redesigned for better circulation, and radiators were installed for heating some of the air in winter in order to effect more rapid movement and increase circulation.

The Department of Health established various stations throughout this unit for determining relative concentrations of carbon monoxide and made various suggestions for ventilating the basement section by means of exhaust fans.

TABLE II  
CASES OF "GAS EXHAUSTION" REPORTED IN A STEEL PLANT

Date 1926	Total Cases	Number of Cases of Varying Intensity			
		Ambulance	Bed	Oxygen	Miscellaneous
January	10	9	9	3	2 2d stage
February	17	16	17	4	
March	3	3	2	1	
April	1	1	1		
May	6	3	3	1	1 sent home
June	8	2	3		1 1st stage
					1 sent home
July	4	2	3		1 2d stage
					1 1st stage
					1 3 weeks
August	4	2	2		
September	4	4	3	3	
October	2	2	1		1 mild

Results of these tests showed that concentrations of carbon monoxide varied from 1 to 4 parts per 10,000. The higher concentration was usually noted in the basement near the seal pots under one or another of the engines. Owing to the design of the building and the layout of pipes and conduits, the elimination of gases from this point was very difficult. Ventilating fans were finally successful in greatly reducing the concentration of carbon monoxide. Preceding this ventilation work every effort was made to stop all leaks from the seal pots and other places. New engine cylinders were installed and one furnace was completely rebuilt. During a temporary shut-down serious leaks in the exhaust tunnel were found. After the elimination of these leaks, there was a noticeable decrease in all forms of gas cases. The company spent considerable money in general overhauling of gas engines and in corrections of gas leaks.

Coincident with improvements in atmospheric conditions, marked increase was noted in electric power production from the generating apparatus served by these engines. It was not until investigations were begun in detail, however, that it was found that the chief source of carbon monoxide contamination at this unit was located where the main exhaust pipe entered the tunnel. An estimation of loss due to leakage at this point was \$1,000 per year. In addition it was found that the tunnel was in a much worse condition than had been anticipated and would eventually have endangered the entire structure. Actual cost of rebuilding this tunnel exceeded \$20,000. It was ultimately completely lined with fire brick because of its waterproofing quality and its resistance to high temperatures.

TABLE III

TOTAL NUMBER OF CARBON MONOXIDE CASES AFTER IMPROVEMENTS IN GAS  
ENGINE UNIT, DURING 1928

Month	Cases
April	2
May	0
June	1
July	2
August	1
September	2

Correction of numerous defects in the apparatus comprising this unit of the plant and much redesigning of ventilating equipment had a marked effect in reducing carbon monoxide contamination of the atmosphere. Precautions against gassing were simultaneously stimulated by the safety department with equally desirable results. For the 6 months following completion of work at the gas engine house only 8 cases of carbon monoxide poisoning were recorded (see Table III).

## BENZOL POISONING IN THE STEEL INDUSTRY

Only rarely in recent years have serious unhygienic results been found in connection with the production of benzol as a by-product in the treatment of coke oven gases. During the past 2 years only one such death has occurred at a steel plant in Maryland, in June, 1927, and, strangely enough, the victim was a foreman in the benzol plant, thoroughly familiar with the hazards involved and completely cognizant of the precautions to be observed. He was killed while working on condenser equipment, having entered the top of the condenser without a gas mask before the benzol gases had had time to escape. He disobeyed regulations familiar to himself—the wearing of a gas mask and the steaming out of the condenser before entry.

## HYDROGEN SULPHIDE IN THE ILLUMINATING GAS INDUSTRY

It is interesting to point out the close interconnection in problems of atmospheric pollution of a number of allied industries. In the discussion on the production of blast furnace and coke oven gas, reference was made to the fact that a considerable number of materials are extracted during the purification of the gases. After this, the bulk of the coke oven gas is sold, in many instances to gas companies who in turn convert the material to domestic and industrial uses for heating, lighting and power. The gas companies for a great many years have been concerned with the removal of hydrogen sulphide and cyanogen gas from such coke oven gases. In most instances, this has been accomplished by passing the gas through iron oxide boxes where the hydrogen sulphide is removed in the presence of the iron catalyst.

Within 7 or 8 years, however, due largely to the efforts of the Koppers Company of Pittsburgh, a new system of purification, known as the Liquid Gas Purification Method, has been developed. Such a plant was installed by the Koppers Company in Maryland, in 1923, in a territory outside of Baltimore adjacent to a semi-urban population of considerable size. The process is designed to remove the hydrogen sulphide from coke oven gas which is to be used for domestic and industrial purposes.

Raw coke oven gas is passed through a tower while soda ash solution is sprayed downward through it. This solution absorbs a large portion of the contained hydrogen sulphide. The gas is then passed on to the plant of the gas company for further treatment before being distributed into the city mains.

The spent soda ash is blown with air, and the occluded hydrogen sulphide is released and passed into the air from the top of a 200-foot stack. It soon became the source of considerable nuisance, in 1924.

The complaints were not only with respect to objectionable odors, but to distinct irritations of nose, throat and eyes in persons living in the vicinity of the plant. The writer can testify as to the validity of these complaints, owing to the distinctly objectionable and severe irritations of the nose and throat experienced during inspection.

As a result of the activities of our department during 1924, temporary measures were taken to alleviate the nuisance by the installation of burners in the lower portion of the purification tower, raising the temperature of the gas and causing it to rise to a greater height with a consequent greater dispersion and dilution. The unheated hydrogen sulphide has a tendency to descend, due to the fact that its specific gravity is higher than that of the surrounding atmosphere. Observations indicated only temporary abatement of the nuisance.

Laboratory experiments by the Koppers Company culminated in the construction of a large experimental plant designed for a complete elimination of the hydrogen sulphide discharge.

The general principles of the supplemental unit involved treatment of the exhaust gas from the stack by means of specially prepared iron turnings, together with a patented catalyst.

Under experimental operations, slight odors were noticeable at 25 feet from the plant with burners at the base of the stack consuming about 750,000 cu. ft. of gas per month. The new process was considered to be functioning satisfactorily, but was incapable of handling the entire volume of gas discharged from the scrubber process. Twelve thousand cu. ft. per day were being treated, about 50 per cent of the estimated capacity of the experimental plant. The combined process made use of two towers, one designed to scrub the incoming gas with soda ash solution and the other to aerate and release the occluded hydrogen sulphide. The unit designed to split off the sulphur from the released gas by aeration in the presence of a catalyst was capable of caring for only about 25 per cent. The remainder of the hydrogen sulphide was therefore discharged into the atmosphere, and continued to create a nuisance.

Efforts were made to eliminate difficulties experienced due to poisoning of the catalyst by cyanogen. One of the two towers was utilized for removing the cyanogen before removal of hydrogen sulphide in the experimental plant. During all this experimental work only slight decrease of odor nuisance was obtained and efforts were made to dilute the released hydrogen sulphide by the installation of an additional blower pending enlargement of the experimental plant and perfection of a more efficient catalyst.

Complaints were brought to the attention of the State Depart-

ment of Health, and efforts were made to speed up the enlargement of the experimental plant. Increased heating units and additional blowers were resorted to by the company pending enlargement.

Perfections in experimental operations were later completed and the treatment plant was enlarged to handle the entire volume of stack exhaust gases, thus eliminating entirely the discharge of hydrogen sulphide. The plant operating at full capacity adequately removed 6 tons of hydrogen sulphide and 2 tons of hydrogen cyanide per day. Sampling stations were established and relative concentrations of hydrogen sulphide were determined by this bureau. The results are shown in Table IV.

TABLE IV

## HYDROGEN SULPHIDE DETERMINATIONS AT GAS PURIFICATION PLANT

July 17, 1925	Per cent
East of scrubbers	0.000315
West of scrubbers	0.00315
800 feet west of plant	0.00126
1,500 feet west of plant	0.00126
July 21, 1925	
700 feet north west of plant	0.029
1,500 feet west of plant	0.006
800 feet east of plant	0.008
30 feet east of scrubbers	0.003

NOTE: Toxic minimum is given at about 0.005 per cent by U. S. Public Health Service (C. W. Mitchell, *U. S. P. H. Reports*, 39: 1, Jan. 4, 1924).

With the elimination of the discharge of any hydrogen sulphide into the atmosphere the nuisance was completely abated. At this time the construction of a treatment plant of a size designed to handle the entire intake of coke oven gas was under way. The resulting sulphur sludge is handled by spreading in the open in layers about 8 inches thick. Filter pressing of the sludge was found to be unsatisfactory.

The Koppers Company made some interesting observations in connection with the above problem, on the concentration of hydrogen sulphide in the air in the vicinity of sulphur springs and baths in this country, well known as health resorts, and the amounts and effects of concentrations of the gas in the air at these are interesting. These observations have not been published, and are referred to with the company's consent. At several of the resorts the concentration of hydrogen sulphide was very slight owing to the fact that the springs were covered and enclosed in box-like structures. At some which were covered only by a canopy, the atmosphere showed above the surface of the spring concentrations of 50 p.p.m. Observations in some of the sulphur baths indicated no objectionable effects where the concentration of hydrogen sulphide was below 10 to 15 p.p.m.



At one resort, which showed almost 15 per cent of hydrogen sulphide by volume in the spring water, the water was aerated before being used in the baths because it was found that the hydrogen sulphide affected the eyes of the attendants. At present in the bath houses the concentration of hydrogen sulphide ranges from 30 to 50 p.p.m. The odor of hydrogen sulphide was not very pronounced due to the fact that these high concentrations paralyze the olfactory nerves. All of the bath attendants wore goggles and still complained of conjunctivitis. The U. S. Bureau of Mines has tentatively established 50 p.p.m. as the minimum concentration causing sub-acute symptoms of hydrogen sulphide poisoning and conjunctivitis.

Similar difficulties with high concentrations of this gas have been experienced in the oil industry.

#### PHOSPHORUS POISONING IN THE MANUFACTURE OF FIRE WORKS

Strange as it may appear, instances have occurred within the past 5 or 6 years, in which this most horrible of atmospheric pollutions has been the cause of damage. Fortunately, several plants at which such poisoning has taken place in Maryland have abandoned the use of phosphorus. The chemicals usually employed at present are mercury sulphocyanide, barium nitrate, dextrose, aluminum oxide, iron oxide, strontium nitrate, potassium nitrate, sulphur, sesqui-sulphide of phosphorus, carbon, etc. White phosphorus was at one time used extensively, but was discontinued about 3 years previous to this survey.

Snakes were manufactured as follows: Mercury and nitric acid were mixed. A paste was obtained by mixing this product with sulphocyanate, and dried in air driers. It was transferred to pellet machines and molded into pellets or tablets. Only one operator is required, who is under instructions to wear gloves and a mask. The latter was only occasionally used. Adequate precautions were taken in respect to ventilation, fire, explosive and storage hazards. Housing and handling of explosives were in separate buildings.

There have been no cases of chemical poisoning since the abandonment of white phosphorus. Previously, 2 cases were recorded.\*

#### CONCLUSIONS

Aside from the technical aspects apparent in the above reports, certain philosophical conclusions appear to be warranted. In dealing with these and other similar situations, one cannot escape the conclusion that the disabilities inherent in any of these examples of atmospheric pollution result largely from the ignorance and inertia of

\* *Industrial Poisons in the United States*, 1925, Macmillan.

both employer and employee. The employer frequently ignores the possible effects of the compounds used in, and resulting from, industrial processes, largely because his attention is directed primarily toward production and distribution, and only secondarily toward the human physiological factors. Too frequently, processes and materials are introduced into common industrial and domestic use without regard to the health hazards involved. Recent difficulties with household refrigerants are another example of the unfortunate results of these general attitudes. The employee, on the other hand, too often does not use such safeguards as are frequently put within his reach. Nowhere more than in industry is the truth of the axiom, "familiarity breeds contempt," more completely confirmed.

These attitudes point clearly to the necessity not only of official health department control over such hazards, but of educating employer and worker alike in the potentialities and methods of avoidance of danger. As in so many other fields of hygienic endeavor, knowledge and its application are the solutions to the risks of atmospheric pollution.

ACKNOWLEDGMENTS—The writer wishes to record his appreciation of the aid of S. T. Powell and M. H. Coblenz, of the Bureau of Sanitary Engineering, in the preparation of field reports and office data respectively, in connection with the studies presented in this paper.

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## Child Hygiene in Rural Districts of Sweden

A CONSIDERABLE part of child hygiene work in the rural districts of Sweden is done by the local public health officer, assisted in some places by midwives and visiting nurses who are also employed by the government.

Lecture courses on child hygiene for mothers are an important phase of this work. Because the long distances are an obstacle to attendance, these courses are sometimes intensified, each course lasting only 3 or 4 days of 3 or 4 hours each. They are usually accompanied by exhibits. The courses are advertised in advance through the local newspapers, and through circulars distributed among the school children. As the rural mothers show little inclination to go out in the evening, more active methods for securing attendance seem to be advisable. Good results have been obtained in some districts by nurses and midwives in public service visiting every young mother in order to persuade her to attend.

It is very difficult to do anything for the preschool child on account of the long distances between the farms. The problem is easier with school children for whom physical examinations are a common practice. The importance of coöperation between home and school as a means of improving the child's health is realized, and in some places the home environment is investigated. Evening meetings are arranged for the parents at which individual cases and general child hygiene are discussed by the public health officer. These meetings are accompanied by musical entertainments, recitations, and story telling. The teachers in rural districts also take part in the work by teaching the children habits of hygiene.—*Tidskrift för Barnavård och Ungdomsskydd*, Stockholm, No. 5, 1929.

# Difficulties Encountered in the Control of Mechanical Refrigeration\*

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THE health hazards of mechanical refrigeration have begun to receive the attention which their importance warrants. Previously the fire and explosion hazards alone were considered in formulating regulatory measures.

Ten deaths and 30 non-fatal cases of injury occurred in Chicago during one year, all of them due to the action of gases used in mechanical refrigerators, without the occurrence of a fire or explosion. The former lack of any clear conception on the part of the general public of even elementary principles of this type of refrigerating apparatus has resulted in a feeling that the cold is produced by electricity, and when the fact is mentioned that toxic gases are employed, it not infrequently causes surprise.

People have taken toxic gases into their homes without question because they have felt that the makers of the equipment would not knowingly expose the public to undue danger. Certain manufacturers have deliberately chosen to use methyl chloride as a refrigerant because it was less toxic than other commonly used gases. The 10 deaths were caused by it. Though less toxic than some others, it is both anesthetic in action and less evident to the senses, and therefore stole upon its victims unawares.

No attempt will be made to go into the question of relative toxicity of various refrigerants. A good deal of information has been accumulated, but it is not so simple a matter to determine how the available knowledge may be applied to preventing unnecessary deaths and injuries, and still retain a valuable feature of modern life.

The public health engineer must find ways and means of administrative control. One of the greatest difficulties in all public health

\* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 2, 1929.

work is to find a practicable method of applying new knowledge and discoveries. If our practice could keep pace with our knowledge, death rates would be lower and certain diseases would soon disappear from the face of the earth.

All refrigerants in common use are toxic. Animal experimentation has given an idea of toxic limits for the various gases employed. Our problem is to prevent leaks of quantities sufficient to produce poisonous concentrations in the air or in foods and drinks. Of course, the ideal solution would be to find a non-toxic refrigerant that could be used at the temperatures and pressures desired. The discovery of such a refrigerant is not likely to occur in the near future because all gases, except the mixture we call air, are toxic in some concentrations.

The importance of this problem is not fully realized either by the public or public health administrators generally. The population in Chicago exposed to the hazard of methyl chloride poisoning from refrigerator leaks is small as compared with that exposed to illuminating gas poisoning, or to typhoid fever through contamination of a large milk supply or of the water supply. Last year we had 16 deaths from typhoid fever in a population of more than 3,000,000, and 10 deaths in an equal period from methyl chloride poisoning in a population of users estimated not to exceed 50,000. Thus it may readily be seen that the problem is a comparatively important one.

No one realizes more fully than the public health worker the immense value of adequate refrigeration in conserving health by the preservation of food; but we cannot allow ourselves to be misled by the arguments of those who advocate cheap refrigeration at the expense of safety. It is as illogical to permit unsafe mechanical refrigeration in order to reduce its cost to the poor classes, as to permit a poor man to drive an automobile without brakes for the reason that brakes cost money.

The number of deaths alone does not give a true picture of the importance of the problem presented by defective mechanical refrigerating equipment. Some of those who have been poisoned, but did not die, have not yet recovered, and there is some question as to whether they ever will be restored to complete health and usefulness. Therefore, we must prevent small leaks that menace health in addition to larger leaks that may cause death.

It will be appreciated that if a system of piping and equipment which contains a refrigerant be made absolutely tight, even though a very dangerous and toxic gas is used, no health hazard will result. This, however, is impossible. At no time have we found a type of construction and workmanship which would assure this. Therefore,

the control of this practice resolves itself, first, into the design and installation of systems that are as nearly leak-proof as possible, and second, into providing maintenance that does not permit of leaks. The design and construction of these systems should be controlled: (1) At the plan examination desk; (2) By follow-up inspections which should be made to assure that the systems are installed in accordance with the plans that have been approved.

In most states there should be no difficulty in providing legislation regulating the submitting of plans to the local administering officer for approval. He should be provided with a competent staff to examine the plans and determine in advance of construction the possibility of leaks, and he should not approve them until he is satisfied beyond a reasonable doubt that the design assures the absence of any dangerously large leak. A thorough inspection should be made before the apparatus is put into use to determine the quality of workmanship and materials as well as the design of the system.

The most difficult problem in the control of this practice is maintenance. Experience has shown that there are numerous conditions which invariably contribute to leaks in refrigerating systems, such as: vibration and settling of buildings, shrinkage of timber and similar materials, and expansion and contraction of rigidly anchored piping systems. In addition we have tampering with the systems by inexperienced persons.

There should be little difficulty in developing control of the design of a system as well as its installation in accordance with the approved plans. This follows very closely the established practice in many cities in installing plumbing and ventilating facilities. On the other hand, the prevention of leaks and their speedy correction is a problem that is somewhat different from that in the control of the other mechanical features of buildings. Our problem is to determine the extent and location of the leak, and the means to use for correcting the condition.

A leak in a system containing a refrigerant may be detected: by the odor which the refrigerant may have, due either to its inherent properties, or to an added odorous substance; by some chemical process which detects minute concentrations in the air envelope; or by a chemical process which will detect larger concentrations when applied in close proximity to the leak. It is also possible to determine whether a system leaks by application of a pressure test.

There is no odorous substance that we know of that can be used with entire satisfaction in a refrigerant. To show some of the difficulties encountered in testing odorous substances, we cite an example

which obtains in the refrigerating industry. Sulphur dioxide has been used as a detector with methyl chloride gas. The boiling points of these substances, while nearly the same, are not alike. Further, when the gases are liquefied they vary considerably in density. It should be apparent to the student of physics and the man who has knowledge of the refrigeration cycle that a mixture of 10 per cent sulphur dioxide and 90 per cent methyl chloride will not be found at different times in that ratio throughout the system. Our tests have demonstrated this to be true. The question arises—if the odorous gases escape more quickly than the non-odorous, will a condition eventually result that no longer insures the expected protection? We know of no method that can be used for detecting minute quantities of refrigerants when there has been an escape of gas into the air envelope surrounding the system, except in the proximity of the leak.

In the case of sulphur dioxide and methyl chloride we have field methods which will detect very small quantities of gas when we are able to approximate the location of the leak. These, however, do not lend themselves to solving the problem of hidden leaks to the extent that the health officer desires, because of the concealed or inaccessible spaces in which the piping and the joints are frequently placed, such as the furred-in spaces in buildings.

In attempting to apply a pressure test when the existence of leaks is suspected, it is necessary to pump down the whole system—which requires several hours—to get the refrigerant out of the evaporator and the piping, and this must be done to a point where there is no liquid left and the entire system registers a sub-atmospheric pressure. If this is not done, the liquid remaining will eventually evaporate and give misleading results.

It is not uncommon in the industry, when the pressure test is applied after the system has been pumped down, to use an inert gas, such as nitrogen, to refill for test purposes. This, however, is costly. If air is used, extreme care must be taken to dry out all of the moisture, especially when refrigerants which become corrosive in the presence of moisture are used, such as sulphur dioxide. To assure the absence of any dangerous leak, it is necessary to hold the system under pressure for at least several hours, and better for 24 hours. After this, the test gas will be let out and the refrigerant replaced. This takes additional time before the system can be put back into normal operation. Throughout this entire period the tenants will be without mechanical refrigeration. The confusion and costliness of such a process can be visualized; so here again we meet with a possible but rather impracticable method of control.

Our experience in trying to locate leaks, even in systems that have been known to leak, has shown that it is often little short of impossible to find them. We have also found that the cost of locating and repairing a small leak is so great that the tendency of service men has been to let it remain, compensating for the loss of refrigerant by placing large amounts in a liquid receiver, and making this much larger than would be necessary in a tight system. In fact, some systems are so constructed and located that unless they have a very large leak, about the only reasonable service that can be rendered is the replacement of the escaped refrigerant. As all refrigerants have toxic properties, we are concerned with their continuous escape in the home even in small quantities. There must be a development of the mechanical features in mechanical refrigeration in the home that will give the health officer an effective control at a reasonable expense to the community and to the building owner, and thus assure safety.

There are several methods which the industry could use in helping the health officer to develop this control. The most satisfactory arrangement found thus far, based on our present knowledge, is to place the system containing the refrigerant, which we refer to as the primary, inside a second gas-tight system vented to the outside air, which we call the secondary. Refrigerants leaking from the primary system are conducted to the outside air by the secondary system and prevented from reaching habitable spaces. Such a double system has been built by a Chicago company at our suggestion and is operating satisfactorily under test conditions at the factory.

To assure the continued tightness of the secondary system, it is evident that it should be built in such a way that a suitable pressure test can be applied easily, requiring very little time and attention and without interfering with refrigeration. There are many designs that may be used for secondary systems, any of which would give the health officer the necessary control of mechanical refrigeration in the home where toxic gases are used as refrigerants.

In conclusion, it should be emphasized that the present rapid expansion of the use of mechanical refrigeration is creating a new and serious public health problem. There is no desire on the part of public health workers to set up a number of varied standards in different cities and states, which, if done, would preclude standardization and mass production of apparatus. We seek to agree upon, first, a proper standard of safety for health as well as for life, and second, an adequate means for securing and maintaining that standard, by suitable plan examination, inspection and tests of the physical equipment.

# Problems of Cancer Mortality Statistics\*

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TO the average observer, and this would include most physicians, there would seem to be no problem. Cancer is cancer and as a rule is readily recognized as such. The primary site is ordinarily easy to determine, either by direct observation or by accurate clinical deduction. Its responsibility for the death of its host is in most cases plainly manifest. Its duration, at least clinically, is usually fairly definitely ascertainable and its general characteristics stand out about as clearly as any other of the innumerable phenomena associated with the death dealing diseases. Why, carps the critic, waste time discussing a branch of vital statistics so well oriented and on the whole so satisfactory, when other much more complex questions are crying aloud for clarification and solution? He may add that although the peculiar and even abnormal psychology of vital statisticians and morphologic pathologists impels them to wrangle largely about artifact-like problems, for the sake of the peace and complacency of the rest of mankind, let them keep these discussions within their own ranks. Let them not endeavor to disturb the existing order of things, which is the result of steady evolution of knowledge and customs and not to be lightly overturned or even amended.

This complacency alone would impel me to question seriously the grounds of our critic's satisfaction with the existing conditions of cancer statistics. Cancer represents a major scourge of the human race, and the terrible quality of its menace is enhanced by the fact that it is slowly but surely increasing in incidence, and that in spite of world-wide study, it remains an almost completely unsolved entity as to etiology, pathogenesis or reason for existence. It is a disease *sui generis*, so far removed in every single characteristic from every other, that before we can fully understand and conquer it we shall probably be compelled to form new concepts of pathology and even add a new branch to our language. These facts well justify us in considering critically the situation which exists in this very important division of

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the study of cancer, namely, vital statistics, or the incidence of the disease in the broadest meaning of the term.

Our problems may be conveniently grouped in two major divisions—the first, intrinsic and composed of those difficulties inherent in the cancer itself; and the second, extrinsic and made up of the troubles encountered when dealing with “many men of many minds” and some with hardly any mind at all.

The intrinsic problems, at first sight comparatively few and insignificant, on closer inspection become many and very, very real, for when we define carcinoma as a destructive neoplasm arising from some epithelial structure of the body and eventually responsible for the death of its host, we have only scratched the surface. This may be illustrated by a consideration of a few of the more significant subdivisions of this supposed entity.

First, and apparently most elementary, are the cancers of the skin. Epidermoid or squamous-cell carcinomas, commonly and erroneously called epitheliomas, are presumably the most definite group for reliability of diagnosis; but as the skin is not *per se* a vital organ, death from such a cancer can only occur when by invasion or metastasis a mortal lesion is produced, or when, by infection, sepsis finally claims its victim. Hence, the secondary injury is the significant factor, and becomes the primary element of statistical inquiry. Moreover, diagnosis is not always easy. Granulomatous lesions of blastomycosis, syphilis or tuberculosis may simulate cancer; or a cancer may arise from one of these lesions of the skin and the sharing of exact responsibility becomes badly confused. Some extraneous factor often underlies the origin of the cancer, such as a roentgen-ray burn, occupational dermatosis or other chronic injury. They deserve the most careful recognition. Is mycosis fungoides cancer? Probably not, but sometimes it resembles cancer and the expert is needed to differentiate them. Does cancer of the skin ever arise from multiple focuses, and if so how may its primary site be located? At least two other “kinds” of malignant conditions of the skin are closely related and yet must be separated. I refer to the so-called basal-cell carcinoma, rarely fatal, and the malignant melanoma, practically always fatal. Both are usually referable to a congenital defect in either the hair follicle on the one hand or the pigment bearing structures of the skin on the other, and this defect often escapes detection.

Next let us consider the cancers of the breast. Here surely “he who runs may read” and statistics concerning them must have a high degree of reliability. But even granting these premises there are important problems. I have known of a scirrhus adenocarcinoma of

the breast which required nearly twenty years to bring about death, and a carcinoma simplex in which the whole course was a matter of a few weeks. Surely something beside the usual data is necessary before our knowledge of such growths makes any appreciable advancement. Also, as with cancers of the skin, cancers of the breast must kill by secondary effects and the analysis of these is fully as important as the primary factor. Again, the diagnosis is not always easy. Tuberculosis and, rarely, other granulomas may confuse us, and our conception of the relative significance of so-called benign conditions of the breast, such as adenomas and cystic disease, may have a profound bearing on the handling of such diseases and the control of cancers of this organ. What is Paget's disease of the breast, and what factor, if any, is largely responsible for its existence? Did the primary cancer of the breast start as a lump or as a bloody discharge from the nipple? Was a definite injury a preceding event or what trauma incident to child nursing did the breast suffer?

I might similarly consider the malignant polyps of the stomach and colon, the so-called round-cell or carcinoid tumors of the appendix and ileum, the sarcomatous or carcinomatous teratoma of the testis, the epithelial derived tumors of the brain, the branchiogenic cancers, and the peculiar malignant changes to which the ovary and uterus are subject. But I have said enough to remind you that in every portion of the body the diagnosis of a cancer may be bristling with questions which are often difficult or even impossible of solution at this time.

Another phase of our intrinsic problem has to do with the location of the primary growth. This ordinarily simple matter may be of extraordinary difficulty. For example, an extensive so-called cancer of the pleura usually has its primary or mother growth concealed in the lung or even in the stomach or other distant site. In fact according to my pathologic gospel there is no such growth as a primary cancer of the pleura, and yet such a diagnosis is frequently made. An original cancer of the liver is among the rarest of all tumors, but quite commonly the metastasis in the liver completely overshadows every possible source of its origin. In fact, it is quite possible that the parent tumor may become so inhibited in its development as to be extremely difficult to locate; authentic cases are on record in which it may have completely disappeared.

As to duration, our difficulties become even more extreme. To the morphologic pathologist, accidentally discovered cancers are of common occurrence. They may certainly exist for long periods without producing a single ascertainable alteration in the well-being of the individual. We know too little about the inhibitory forces of the

body which hold in abeyance, perhaps for many years, a cancerous growth. The "history" begins with the appearance of this growth above the surface of clinical phenomena, after which its course may be extremely rapid. Like the iceberg, however, a large portion of its "duration" may have been submerged in a symptomless sea. Even the proper evaluation of symptoms has its inherent grief. When does a long story of gastric ulcer or simple indigestion become the short finale of a gastric cancer? When have the irregularities of the menopause given place to the disturbances of a uterine neoplasm? At what time did the prostate gland cease to cause obstruction by benign hypertrophy and begin a similar obstruction because of a malignant transformation? Probably no single element of our statistical data is so full of inaccuracies as that of duration.

It is in the consideration of the extrinsic group of our problems that we may become vituperatively eloquent, for here we are dealing with the mental foibles of our fellow man and his many sins of omission and commission. Psychologically speaking, human nature finds it very easy to discuss and cuss its neighbor's faults and I must admit that for the statistician, particularly one who deals with mortality returns, this same neighbor all too frequently lays himself wide open to a justly deserved scolding. Of all the inane stupidities which man may commit, the physician who fills out a death certificate is often the perpetrator of the lion's share. Not only is he unable to write the English language, but he cannot even read it or understand what he reads. His errors are Gargantuan and he makes so scrambled a mess of the simplest questionnaire that the patience of Job and the serenity of a philosopher must be the essential mental equipment of all mortality statisticians, else their spleen would perforce topple reason from its throne and turn them into raving madmen.

Having eased the pressure somewhat by letting off steam, we may more calmly approach this exceedingly human side of our problems. Our dilemma has to do with the physician, and he often fails us because he does not realize fully what we want, or why; and he does not know the real answer to our question, and knowing that he does not know becomes purposely careless in giving the best possible substitute. On whose shoulders rests the responsibility for this lamentable state of affairs? Does not a certain share belong to the official and semi-official groups which you and I represent? Who ever heard of a medical student being specifically instructed, as a part of his course, how to fill out a death certificate? \* What means of intelligent or sympa-

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\* I have recently learned that in the Minnesota State Department of Health this instruction is now being given. Perhaps in other states this is also true.

thetic propaganda have been adopted to acquaint the practicing physician with the value of properly collected vital statistics, with the aims of this division of the state department of health and the U. S. Bureau of the Census, and with the problems which they are so valiantly endeavoring to solve? To this same physician a governmental bureau is largely impersonal and for impersonal things he has little time or attention. What attempts are made to vitalize the dry dust of the mechanics of vital statistics and to bring before the mind of every physician in the land the imagination gripping epic of our tables of life and death?

We may seem to have drifted from the field of cancer to that of generalities, yet *these* are the problems of cancer statistics and they are major problems. We must, above all, have the intelligent coöperation of the attending physician, and to obtain this we must see that he is both coöperative and intelligent. The problem begins in the medical school and continues throughout the life of the practitioner. He must know what we know about cancer or at least how he can find out what we know. He must be encouraged to classify carefully the character of the malignant growths which kill his patients and to trace their origins and their effects. Beyond all he must be admitted as a partner into this vast undertaking and as such made a full participating member of the firm, with a full knowledge of constitution, by-laws and all rights, privileges and duties thereunto appertaining.

Perhaps our death certificates should be changed to meet the special needs of cancer cases. I am inclined to think so, but with such moves we must proceed cautiously, and it is not my purpose at this time to comment on this important phase of our work. Our main effort must be directed toward the collection of accurate and dependable data concerning deaths from cancer, and to do this we must ourselves advance with the advancement of medical knowledge and encourage the practicing physician, who is the source of these data, to keep pace and to enter into our labors as an intelligent co-partner with full freedom of criticism or suggestion. To accomplish this we must magnify, if possible, the importance of our work. We must never forget nor let the scientific world forget that the field of vital statistics in the study of cancer, as well as of all other diseases, is a vital component of medical research. Statisticians and pathologists are likely to develop an inferiority complex. Laboring in the zone of the interior far from the battle line where the spectacular fighting of disease occupies the world's attention we are tempted by sheer isolation to minimize the basic importance of our endeavors and to fail to plead unceasingly, day in and day out, their significance.

Our problems are, then, like those of all other groups, partly inherent, and as such, for the time being, often without proper solution. They are also partly extrinsic, and as such have to deal with the eccentricities of the human mind and its mode of thought. For all of these there is a large promise of the future ironing out. The stimulation afforded by our efforts and the huge stake created by the welfare of the human race, carry with them an adequate reward for even the humblest of workers in this vast undertaking in which we are privileged to be active participants.

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## Trembles, or 'Milk Sickness,' Reported Rare Among Humans

"TREMBLES" is the name now given to a disease often called "milk sickness" in the days when population was spreading westward in the Ohio Valley. The disease affects animals as well as human beings, and it may be transmitted to people by animals that have eaten white snakeroot, a poisonous weed. In some areas of Arizona and New Mexico the same disease results when cattle eat either of two species of the rayless goldenrod. Investigators of the United States Department of Agriculture have made feeding experiments with the plants, and J. F. Couch, a chemist of the Bureau of Animal Industry of the Department specializing in the causes of livestock poisoning, has isolated from the plants the poisonous substance, tremetol, which causes the disease.

In pioneer days the disease was reported frequently, usually by the name of "milk sickness." The Department of Agriculture considers "trembles" the better name, as it suggests one of the symptoms. There is no recorded case of the disease in a city. All known cases have originated either on farms or from milk products supplied directly from farms. In the general milk or cream supply for a city or in creamery butter the poisonous substance would be so greatly diluted that it would hardly be possible for it to be harmful, the men who have studied the disease believe.

Eradication of white snakeroot in the trembles areas in the eastern States and of the rayless goldenrods in the Southwest will remove all danger, and neither weed is particularly persistent or hard to eradicate. The bulletin should serve, the author believes, to allay suspicion of milk as a food. Trembles is relatively a rare disease among humans in these days.—*United States Daily*, Jan. 8, 1930.

# Free Clinics for the Preschool Child\*

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THE duty of protecting the public health is the particular business of governmental or official health agencies. The character of the health protection rendered, while it rests to a certain degree with the citizens of the community, rests to a larger extent with the officials charged with such duties. It is the duty of official agencies not only to exercise police authority for the protection of the public welfare in general but, where they are not otherwise provided, to establish and conduct medical and educational services which the poor require.

In that sense, it is the duty of health departments to maintain clinics for the individual who is economically unable to go to the private doctor, and health departments are justified in maintaining free mental, dental, postural and nutritional clinics for the preschool child if the community fails to give such service through other channels, for among children of this age, malnutrition and defects of teeth, tonsils, and breathing are more prevalent than among school children, to say nothing of the recognized importance of mental hygiene in this early age group.

Let me recall what steps were taken in the campaign against tuberculosis and the venereal diseases. In New York City in the 90's there were practically no clinics available for the diagnosis, treatment and supervision of cases of tuberculosis. The Department of Health not only felt justified but recognized its responsibility to establish special tuberculosis clinics. In the 35 years which have passed, the attitude of public hospitals and clinics toward tuberculosis has materially changed and there are now sufficient facilities in these to take care of the tuberculous. Such patients can now secure the examination, treatment and supervision which the special Department of Health clinics aimed to give. Because this work has been effectively taken over by these other health agencies, the Department of Health is now withdrawing from the tuberculosis clinic field, and in place of the treatment clinics there are being established a few special diagnostic stations to which private physicians can send patients. This same de-

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\* Read before the American Child Health Association and the Child Hygiene Section of the American Public Health Association at the 18th Annual Meeting, at Minneapolis, Minn., October 3, 1929.

velopment will probably repeat itself in the case of the venereal disease clinics.

When it comes to clinics offering medical examinations, nutritional, dental and mental hygiene services to the child of preschool and school age, you find conditions similar to those existing in respect to tuberculosis 35 years ago. The general hospitals and their outpatient departments have not yet become educated to caring for apparently well children with a view to keeping them well. They do not yet realize the important service they can render in the matter of periodic health examinations. They are still concerned largely with attempting to cure sick individuals. Experience shows that it is far more important to keep persons well than to attempt to cure them after they have become ill. Until such time as we can get the hospitals to adopt this modern viewpoint, it will be necessary for the Department of Health to establish clinics and health stations of the type mentioned.

It has been estimated that 50 per cent—and this is probably a low estimate—of the people in the City of New York can afford to purchase their own preventive health service. The doctor should supply the preventive service to those who can pay—the health department or some other official or semi-public agency to those who cannot.

America is doing more for the expectant mother and the newborn infant than is any continental country; but it is time we concentrated as much energy and activity on the preschool child as we now do on the infant and the school child.

The brightest page in medical and social history is the record of improvement in infant welfare, to which the greatly reduced mortality and improved physique of present-day babies bear eloquent witness. From Sir Arthur Newsholme, former principal medical officer of England's Local Government Board, comes this pertinent quotation:

Knowledge has spread to an extent which puts the poorest mother of today in a better position to secure her infant's health than were the well-to-do a generation ago.

Nor has the school child been ignored in the public health program of an enlightened and progressive community. The same, however, cannot be said for the preschool child. Its health needs have been ministered to in a more or less desultory fashion. There are many private organizations throughout the country interesting themselves in the preschool child, but many of these are not so well equipped as the health departments to direct this vital work most effectively.

The very fact that in New York City approximately 38 per cent of

these youngsters entering school for the first time show some form of physical defect is the best proof possible that we have failed to follow up our health activity with the same thoroughness and effectiveness that we expended on them as babies. Of the total number of children examined last February upon their entrance to school, 25 per cent had defective teeth, 16 per cent had enlarged or diseased tonsils, 14 per cent were undernourished, 13 per cent suffered from defective nasal breathing, 10 per cent had defective vision, over 1 per cent had some form of heart disease, while another 1 per cent had defective hearing, orthopedic or nervous defects. We have found that many school children who are not promoted are not necessarily dull pupils. Usually such boys and girls are suffering from some physical defect that should, and could, have been corrected in their preschool days. When these defects are cleared up, experience shows that these children rank equally with others in scholarship.

It is interesting to note that as far back as 1914, England awoke to the realization that the preschool child was not receiving its measure of health attention. In a letter to county councils and sanitary authorities July 30, 1914, the Local Government Board pointed out:

Up to the present, local authorities in their infant welfare work have concerned themselves more especially with the child in its first year of life; the matter is, however, one which needs to be dealt with on a more comprehensive basis and it is clearly desirable that there should be continuity in dealing with the whole period from before birth until the time when the child is entered upon a school register . . . Extension of the existing work is accordingly needed in two directions: on the one hand it is necessary that measures should be taken for securing improved antenatal and natal conditions; and on the other, provision should be made for continuing the work in relation to children beyond the first year of life.

What the future health of the child is to be depends on the care it has in the beginning, but it also most certainly depends on an effective follow-up of that beginning. Assuredly, a little child is entitled to as much care as a slip of a plant requires in order to take root and live. Yet many children, once they have passed the baby stage, have been given far less care. Many of them, like Topsy, have "just growed."

The health department is the logical agency to take the situation in hand and lead the way in the matter of providing mental, dental, postural and nutritional services for preschool children. If the fees of the private physicians and dentists specializing in these phases of medicine are not within the reasonable possibilities of the average income, and if the hospitals and other health agencies in the community do not offer help in this direction, the health department must. I believe the health department is justified in maintaining such free clinics to the extent that the health of these children is bettered and safe-



guarded: is justified in leading the way and in carrying on such services until private physicians and other health agencies indicate they are ready and willing to take over this work. I further believe that even when that work is taken over, the health department should still retain a certain amount of jurisdiction.

The time is not far off when every large city will have district health centers at strategic points, just as we have today our district police and fire headquarters. The people of a community would soon protest vehemently if their particular district were not supplied with adequate police and fire protection. There is just as much need in a district for health protection—and it is to the district health center of the future that we look for that protection. The health center will serve those who are too poor to pay the private doctor; it will have a special division catering to the needs of the preschool child; and it will also provide the physicians of the neighborhood with a central service where X-ray facilities and every means of biological analysis will be at their disposal. The doctor is the most important factor in the whole public health movement, and I cannot be too emphatic in my statement that the development of these neighborhood centers should, and would, in no wise interfere with the relationship of the patient to his private physician.

Whenever we mention the maintenance of free clinics—whether for baby, preschool child, school child or adult—we tread on delicate ground. We touch the economic sore spot of the medical profession. The past two decades have witnessed an astonishing amount of curative work by health departments, and the relationship of the private practitioner to the public health program has subsequently become a matter of great contention. Many doctors have displayed hostility from time to time to certain health department activities, on the economic ground that such activities were trespassing on the private domain of the medical profession.

In New York—and I believe it is true of most communities in our country—such activities have rarely been established where the private physician could and would supply the necessary service. Our experience indicates that if, side by side with the establishment of such activities, an honest effort is made to have as much of this work done by private physicians as possible, in a short time the medical profession will realize that, far from making inroads on the practice of the private physician, it will result in a considerable increase in his private practice. After all, most people who can afford to pay a modest office fee prefer to have their children examined and treated by their family physician rather than seek such examination and treat-

ment at a public clinic. It is necessary, however, for the medical profession to be educated to the type of service demanded, and this educational movement is a direct responsibility of the health leaders of the community.

In this connection, let me emphasize the importance of standardizing fees for certain specific services such as the medical examinations of the child of preschool and school age, the periodic medical examination of adults, removal of tonsils and adenoids, toxin-antitoxin treatments against diphtheria, etc. This can usually be brought about through the coöperation of the health department and the county medical society. We have just had an interesting example of such an experiment in New York in connection with the fixing of a flat fee of \$6.00 for the three toxin-antitoxin treatments.

To get back to the specific case of the preschool child whose health wants have been neglected, it is the health department that must get busy along this line. We have concentrated too little attention on those from 2 to 5 years of age, particularly in regard to the mental, dental, postural and nutritional aspects.

I would like to see mental hygiene an important function of the health department. The number of mental defectives, of neuropathic and psychopathic persons in our communities, has increased. If we had the facilities to do preventive work with the preschool child—if we maintained free clinics for mental hygiene where children inclining toward peculiar behavior could be studied—we would be given the wonderful opportunity to adjust them to their environment, and eventually to start them out toward adulthood, unhandicapped by mental illness.

The promotion of mental health belongs with the health department and should be undertaken and maintained by that department. In large cities where there are special institutions for the care of mental cases, it would be advisable for the health department to coöperate with them in the establishment of the clinic facilities demanded.

More intensive nutritional work needs to be done. Only by the adoption of an individualistic method, however, can full benefit accrue from any nutritional service, and that is the type the health department should establish. This is equally true of a postural clinic for the preschool child. The popular "slouch" of today gives every indication that there is a crying need for such service at that early age when good posture can most effectively be taught.

And now we come to the last of the clinics in question—the dental. While New York can boast of 152 dental clinics, maintained by the Department of Health, hospitals and private agencies, and while only

12 of these exclude children entirely, a mere handful treat the preschool child. I am told that two day nurseries give dental service to their children twice a year. Here again we find too little attention given to the preschool period—especially when we realize that the 2-year old child is not too young for his first visit to the dentist.

The New York City Department of Health has only one special preschool clinic. Even this was established through the aid of the Milbank Fund. It is operating in the Bellevue-Yorkville Demonstration Area and reached 414 children during the past year. In coöperation with a number of private agencies, some additional work for preschool children was done. The subject of the examination of more preschool children has been much discussed during the year, and parent-teacher associations and others have been invited to coöperate in teaching parents to have their children of preschool age examined, and defects corrected.

It is my hope that our one special preschool clinic will multiply into as many as are needed to give proper supervision to the little ones who have graduated from babyhood, and yet who are not quite ready for the first step into that more grown-up world of school.

Child care must fail unless the individual mother and the individual child are dealt with as individuals. You can cast bullets in a mould, but children cannot be handled that way. No book can teach the lessons of how to make a child thrive. It is to the private physician the mother must turn for help and advice. But where a mother cannot afford to go to a private physician, the health department is justified in stepping in and offering her help and advice.

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## Public Health in Mexico

SEÑOR Ortiz Rubio, inaugurated on February 5 as President of Mexico, stated his policies on public health as follows:

In the realm of health and culture my government will use all its power to assure the internal growth of our people by attacking the causes of our infant mortality, which at present reaches almost 50 per cent of births, by developing hygiene in our town and among our workers, especially in the industrial centers.

President Rubio in announcing his cabinet announces the appointment of Dr. Rafael Silva as Chief of the Department of Public Health.

# Effect of Prenatal Care Upon the Infant\*

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IT is perfectly obvious that the primary function of prenatal care is, and must always be, directed toward the care of the mother; her health is the thing of first importance. It has been felt that such care would have a very beneficial effect upon the offspring. When we assume that the health of the mother presupposes the health of her unborn child, we are taking a position which is probably correct in part, but not definitely proved. We have some reason to raise this question because we know that unfortunately there are born to women, who are apparently in perfect health, deformed and deficient infants. One need only mention mongolian idiocy.

The question of the effect of prenatal care on the infant should be approached from two angles: first, the main, and second, the remote effect. Knowledge of the physiologic and pathologic conditions of the fetus is almost altogether lacking, and with this lack in our knowledge we grope along, empirically attempting to use such scientific facts as we possess. The first test of prenatal care will probably be its effect on neonatal mortality. In spite of the fact that much of the mortality in the first few days of life depends upon obstetrical care, it seems not unfair to expect that prenatal care will bring about a reduction.

The most enlightening statistics from this country are those of Holt and Babbitt. Their first statement calls attention to the imperative necessity of the study of disease in the first few days. They state that of 100 infants' deaths occurring in the first year, approximately 33 are in the first month, 28 in the first two weeks, 22 in the first week, and 13 on the first day. This study was made on a total of 10,000 births at the Sloane Hospital for Women in New York. Of these, 253 were abortions, 429 stillbirths, and 9,318 living.

An analysis of various other statistics shows that the vast bulk of

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\* Read before the joint session of the American Child Health Association and the Child Hygiene Section of the American Public Health Association, at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 2, 1929.

deaths at this age occurs as a result of prematurity or congenital debility. For instance, in the Baudelocque Clinic from 1901 to 1908 there were 345 deaths in the first 10 days of life. Of these, 275 were due to congenital debility (prematurity), 32 to syphilis, 10 to hemorrhage, 5 to digestive troubles, 6 to pulmonary troubles, 4 to icterus and 3 to erysipelas. This group represents a fair list of conditions met with sufficient frequency to claim our immediate attention.

When we analyze the cause of congenital debility, we find that the chief item consists of "unknown causes" 60 per cent, and that twins and triplets account for 15 per cent more, which means that in the present state of our knowledge 75 per cent of the cases of congenital debility are from unknown causes or from conditions over which we have no control.

If we further analyze the remaining 25 per cent, we find that 8 per cent, or about one-third, are due to disease of the mother, of which tuberculosis is most prominent, and such conditions as anemia, nephritis and heart disease are worthy of mention. It would seem that the only way to overcome mortality from these sources in most cases would be to prevent conception.

The next group, consisting of 4 per cent, does not offer much better chance, since it is caused by habitual premature labor. We see, therefore, that almost exactly seven-eighths of our cases of congenital debility are from causes which, in the present state of our knowledge, are beyond our control. The two chief causes in the remaining groups are gynecological conditions, such as placenta previa, and syphilis. We here come to conditions which should be, and are, relatively easy to master and it is in one of these, syphilis, that we get the best results from prenatal care. Acute infections of the mother, eclampsia, trauma and induction of labor, are conditions in which we may at least hope to get better results.

When we turn from the premature to the deaths in infants at term, the picture is decidedly brighter. There is no question that prenatal care has materially reduced the chance of death from syphilis in offspring. The earlier in pregnancy the mother applies for prenatal care, the greater are the chances of success. It may be said that we cannot expect, in the present state of our knowledge, to reduce the deaths from congenital malformation. The other conditions, hemorrhage, digestive and pulmonary troubles and icterus, can be little influenced by prenatal care.

Is the chance of success in reducing infant mortality by prenatal care quite as small as would seem to be indicated by the foregoing analysis? I think not.

There are some outside factors which a simple analysis of statistics from obstetrical clinics do not bring out. First and foremost, prenatal care means, in all probability, better obstetrics. The man who follows his patient through the period of pregnancy is much more likely to prepare himself to meet the problems of confinement more intelligently. Again, it seems altogether likely that our efforts to promote the health of the mother will meet with some unexpected successes for which we cannot account at the present time. And last but by no means least important, such care will stimulate scientific effort to investigate the problems relative to the newly-born infant and the fetus.

In conclusion, I might beg you to withhold your judgment regarding the effect of prenatal care for a period of years. The problems to be solved are neither so obvious nor so easy as those we have had to meet in reducing infant mortality, and success can be expected only after long years of earnest and persistent study.

## Effect of Intranatal Care Upon the Infant\*

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WHAT happens to the child as a result of the obstetrical care it receives during the process of being born? If all prospective mothers were normal, and nature did her job 100 per cent, no intranatal care would be necessary. Neither of these suppositions being true, a certain percentage of cases must have some interference.

It has generally been taught that 80 per cent of all pregnancies are normal and capable of spontaneous delivery. We will assume then that 20 per cent of infants need intranatal care in some degree. In Europe fully 85 per cent of the children are born with no other supervision than midwives who have had more or less training in the field of obstetrics. When interference in promoting the child's delivery is thought to be necessary, an obstetrician is called in. In the 85 per cent supervised by midwives, very little intranatal care is given the child—nature is permitted to take its course and rarely is an anesthetic given the mother.

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\* Read before the joint session of the American Child Health Association and the Child Hygiene Section of the American Public Health Association, at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 2, 1929.

In this country, on the other hand, 85 per cent of births are in the hands of physicians, with a much greater percentage in which obstetrical interference is thought to be necessary. There is no accurate means at present of determining what effect this has upon the infant, and how the number of birth injuries in Europe compares with the number in this country, although the Scandinavian countries with a system of well trained midwives claim the lowest mortality of any in the world.

That there is a large number of injuries to the infant directly attributable to the process of being born, pediatricians, and especially those who have intimate contact with a children's hospital, can attest. Every day and every week during the year there is a constant procession of these maimed children with all varieties and degrees of injuries passing through, for most of which little if anything can be done.

We are constantly seeing the effects of injuries about the face and head as a result of forceps; paralysis of the arms from injured brachial plexus; and fractured femurs from traction. Many of these are transient in character, but not infrequently permanent scars and paralysis of the muscles are carried through life.

The birth paralyses are so frequent and so appallingly hopeless in the way of treatment that one wonders if all of these injuries are inevitable. Of course we know that many intracranial hemorrhages occur in spontaneous births which have had no intranatal care whatsoever. There are, however, a good many of these cases which after instrumental delivery, and after version, give definite evidence of intracranial hemorrhage directly at birth.

The demand in this country for painless, rapid childbirth is responsible for much unnecessary interference on the part of the physician, accompanied by the use of the various forms of anesthetics and drugs. What do we know of their effect upon the infant? If the injuries sustained by the child in the process of being born are inevitable, and the best intranatal care which science can offer—and only when it is needed—is being given, then we must be content. If, however, the conviction which many careful scientific observers have is true, that a good percentage of these tragedies are unnecessary, it is the duty of the American Child Health Association and all others who are interested to make a searching examination to discover the truth and find means to remedy whatever practices are found to be detrimental to the best interests of mother and child.

# Effect of Antepartum Care of the Mother\*

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THE specific measures that have effected the reduction of both maternal and infant mortality can best be evaluated by a brief analysis of statistics for a series of years covering causes of infant and maternal mortality together with a consideration of factors affecting the rates.

The latest complete statistics available from the U. S. Bureau of the Census for the entire birth and death registration area are for 1927.

We shall begin our analysis and comparisons of maternal and infant mortality with 1922 and continue through 1927. Late in 1921 Congress passed the Maternity and Infancy Act, which granted federal aid to the states for the promotion of the welfare and hygiene of maternity and infancy. Many states accepted the aid in 1922, and expanding programs as well as new state bureaus and divisions of maternity and infancy were made possible. By the close of 1927 all but 3 states had accepted the terms of the Act. These 3 increased their appropriations and activities in the field of maternal and infant hygiene.

Practically every state-wide public health program relating to maternal care has been initiated since the passage of the Maternity and Infancy Act.

The public, and especially expectant mothers, have been informed of the importance of early and continuous supervision of pregnant women by competent physicians or obstetricians. This information has been given through literature, conferences, visits of public health nurses and the distribution of prenatal letters. Each year state reports show that increasing numbers of childbearing women have been reached.

The birth registration area of 1922 contained 30 states and the District of Columbia. Before the close of 1927 the area had increased to 40 states and the District of Columbia, by the addition of 11 new states (South Carolina was dropped in 1925), 7 of which had higher

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maternal mortality rates and 5 higher infant mortality rates in 1927 than the area as a whole. The inclusion of these states tended to increase rather than decrease the maternal and infant mortality rates in the expanding area, yet both were lower for the whole area in 1927 than in 1922, 76 babies dying under 1 year of age of every 1,000 live births in 1922 and 65 in 1927. The rate for women dying from puerperal causes was 66 for every 10,000 live births in 1922 and 65 in 1927.

A comparison of rates for the states and the District of Columbia in the area in 1922 with those for the same states and the District in 1927, exclusive of South Carolina, gives a fairer picture of conditions and shows a greater decrease in mortality for both mothers and infants. For this area the infant mortality rate was 76 in 1922 and 64 in 1927. The maternal mortality rate was 65 per 10,000 live births in 1922 and 62 in 1927.

Infant mortality showed reductions from all causes in 1927 compared with 1922, except deaths from external causes, for which the rate remained the same in both years. The efficiency of public health measures, including the stressing of breast feeding, better formula feeding, better care and hygiene of infants, and the increase in the number of pediatricians and specialists on infant feeding, were reflected in the reduction of the infant mortality rate due to gastrointestinal diseases from 13 in 1922 to 8 in 1927, and of that due to respiratory diseases from 14 in 1922 to 10 in 1927. The reduction in infant mortality due to natal and prenatal causes from 36 in 1922 to 34 in 1927 cannot be attributed to the better care of the baby after birth, but indicates better care of the mother before the birth. Not only was the infant mortality rate from natal and prenatal causes lower in 1927 than in 1922; there was during the intervening period a downward trend in the rate due to these causes, which seems to reflect the growth of public health work in maternal care.

An analysis of maternal mortality by causes shows slightly lower rates in 1927 than 1922 for accidents of pregnancy and of labor. The decrease in the death rate from puerperal causes is accounted for almost entirely by a decrease in the rate due to albuminuria and convulsions—18 per 10,000 live births in 1922, and 15 in 1927. It is in this group of causes of death that we should expect antepartum care to have the greatest influence. Certainly, the reduction in rate has been coincident with the increase in health instruction to expectant mothers and the improved care given by physicians.

However, we have not yet reached the irreducible minimum for puerperal mortality due to albuminuria and convulsions. This is

shown by the study of maternal mortality for 1927 and 1928 made by 15 states in coöperation with the U. S. Children's Bureau. An analysis of the material for 1927 shows for 13 states nearly 800 deaths due to albuminuria and convulsions. Reports on prenatal care were secured for 728 cases. More than half of the women (373) received no prenatal attention. Of the 355 who had prenatal care, only 20 mothers had the grade of care which conforms approximately to the requirements in *Standards of Prenatal Care* prepared by the Consulting Obstetrical Committee of the U. S. Children's Bureau and issued by the bureau. Seventy-six mothers received care below this high standard, but regarded as good, and 64 had fair care beginning somewhat late in pregnancy. In 3 cases the care could not be graded, but such as was given the remaining 192 mothers in this group was wholly inadequate.

This statement of the amount and kind of prenatal care given relates only to a group of women who died from albuminuria and convulsions; a survey of mothers surviving childbirth might show a larger proportion receiving proper prenatal care.

However, the mortality study shows that of the 728 women in this group for whom a clear report on antepartum care was given, more than four-fifths had inadequate or none.

A further analysis by causes shows no improvement in the rate from puerperal septicemia from 1922 to 1927 in the birth registration area of 1922 (exclusive of South Carolina). The rates were 23.7 in 1922 and 23.9 in 1927 per 10,000 live births.

Of the 3,234 puerperal deaths in 13 states analyzed for the maternal mortality study of 1927, 1,278 (40 per cent) were due to septicemia. One of the objects of the study has been to determine the underlying causes of the deaths from sepsis, which form so large an element of the puerperal losses. Abortions preceded 45 per cent of the deaths. Of 570 abortions, 309 were induced, 154 were spontaneous, 19 therapeutic; for 88 the type was unknown. Thus abortions known to be induced were responsible for about one-fourth of the deaths from sepsis.

A study of 796 cases in the sepsis group to which prenatal care could have been applied and on which a report was made, showed that nine-tenths of the women had inadequate or no care.

Since puerperal septicemia is developed postpartum in a majority of cases, antepartum care is not so influential a factor as when related to toxemia. Such care is advantageous, however, in that earlier recognition of conditions gives the obstetrician a greater choice of methods to be used at the time of delivery. Unquestionably the

elimination of induced abortions would lower the maternal mortality due to septicemia. Information on the relation of sepsis and induced abortion to our high maternal mortality rates should be included in education of the public as to the importance of prenatal care.

#### CONCLUSIONS

1. Antepartum care of the mother has reduced infant mortality due to natal and prenatal causes and can reduce it still further.

2. The reduction in maternal mortality noted has been chiefly due to a decrease in deaths from albuminuria and convulsions, and antepartum care of the mother has been an important factor in that reduction; further, the extension of adequate antepartum care would prevent many deaths from this cause.

3. Although antepartum care of the mother has not diminished the mortality rate from puerperal septicemia, reduction from this cause may be anticipated as a result of a more thorough understanding by the public of the danger of septicemia following induced abortion.

4. The promotion of antepartum care of the mother through public health programs has effected reductions in infant deaths from natal and prenatal causes and resulted in a lower mortality rate for mothers from puerperal albuminuria and convulsions.

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### Protection of Children and Women Workers in Germany

LABOR inspectors in Germany report a decrease in 1928 in the number of children under the age of 14 employed in part-time work before or after school, as messengers, newsboys, and the like. This decrease is attributed to a changed attitude on the part of parents, coöperation of school teachers in the enforcement of the child labor law, the prevailing unemployment conditions as a result of which employment agencies give the preference to adult applicants for jobs, and better coöperation between inspectors and the child welfare authorities in enforcing the laws. A shortage of apprentices in many industries is noted due to the decline in the birth rate during the World War.

The inspectors report that both employers and workers show an increased interest in the enforcement of the maternity benefit law, which provides a rest for employed women of 6 weeks before and 6 weeks after the birth of a child. There has been a tendency in Germany recently to increase the amount of the benefit more nearly to approximate the wages lost.

A law of 1929 has increased the amount of the maternity benefit to three-fourths of the wages, and in Saxony the Government pays out of State funds the difference between the wages and the maternity benefit. In order to familiarize the women workers with the law in some places, for instance, Saxony, talks are given to the workers and circulars describing the law on maternity protection are distributed.—*Reichsarbeitsblatt*, Berlin, No. 35, 1929, Part III, p. 302.

# Health and Safety Survey of 25 Leading Department Stores in New York\*

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THE modern department store is a veritable exposition. Its display of goods educates the public to their proper use; for person and for home, for healthful city life and for wholesome country life. More and more as time goes by, has it housed its merchandise in beautiful structures, conveniently segregating its articles into groups. Its contact with the public being intimate, its environment and personnel need be such as to protect the health of its shoppers. Its relations with its employees being dependent upon efficiency, it must also insure for them safe and healthful working conditions. The purposes of this survey were to determine the extent the department store succeeded or failed in its responsibilities toward the shopper and toward the worker, and to correct conditions inimical to health and safety.

New York City furnishes such a wealth of material that it was necessary to limit the number of stores for study. Twenty-five have been investigated: 16 in Manhattan, 4 in Brooklyn, 4 in the Bronx, and 1 in Queens. Of these the first 3 (Table I), A, B, C, were from the great chains of 5 and 10 cent stores, and the remaining from the department stores. The size of these stores may approximately be measured by the number of employees in each as shown in Table I.

To give an idea of the tremendous business done, it is worth mentioning that the yearly sales of one store amounted to over 122 millions of dollars.

That the responsibilities of the operations of department stores may be properly placed, it was necessary to become familiar with their organization charts, where available, which vary in arrangement with each store. The general functioning of a store requires financing, merchandising, publicity, service and personnel. There are many subdivisions of these and it was valuable to know them in order to establish properly their relations with the occupations of the personnel.

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\* This work was carried on under the direction of E. S. Morton, M.D., Chief of the Division of Industrial and Adult Hygiene, Department of Health, New York, N. Y.

TABLE I  
NUMBER OF EMPLOYEES IN STORES SURVEYED

Borough	Store	No. of Employees	Borough	Store	No. of Employees
Manhattan	A	58	Manhattan	N	4,336
"	B	97	"	O	1,203
"	C	61	"	P	1,724
"	D	3,831	Bronx	Q	268
"	E	1,002	"	R	192
"	F	1,858	"	S	123
"	G	2,014	"	T	183
"	H	7,500	Brooklyn	U	62
"	I	350	"	V	1,400
"	J	1,838	"	W	1,892
"	K	3,300	"	X	2,693
"	L	4,101	Queens	Y	120
"	M	754	Total, all Boroughs, all stores.		40,965

Though all are workers of a mercantile establishment, the employees were found distributed in the following occupational groups: trade, manufacturing and mechanical industries, transportation, professional services, and personal services. In order to observe the particular kind of work of each employee, the materials handled by him, the possible injurious working conditions, exposures or hazards surrounding his work, and the precautions taken or omitted in overcoming such hazards, the writer visited all the places which housed the various activities.

For the purposes of this survey it has been found convenient to classify the activities into the following general divisions: (1) Buying, (2) Receiving, (3) Marking, (4) Storing and warehousing, (5) Transporting and delivering, (6) Displaying, (7) Selling, (8) Manufacturing and altering, (9) Serving shoppers, (10) Serving employees, (11) Serving building, (12) Administrating finance and statistics. Each of these general divisions comprises numerous special activities occupying spaces in the structure or structures of the plant. The writer has

TABLE II  
MERCHANDISE ACTIVITIES  
Buying, Receiving, Marking, Storing, Selling

Merchandise office and management
Receiving and marking rooms—Stocking and warehousing rooms
Sample room
Comparison office
Selling departments
Dry goods and accessories
Home furnishings and accessories
Women's and misses' ready to wear and accessories
Infants' and children's wear
Men's and young men's wear
Small wares
Miscellaneous
Service departments

presented in tables, the number of stores engaged in each special activity.

Table II shows the merchandise activities, each store handling various articles too numerous to mention here. In one there were 160 selling departments. From a health point of view it is important to know for example that brushes are free from anthrax, that they have been properly marked for identification, and that cosmetics are free from poisonous ingredients. Similar knowledge is necessary for other goods. Injury to workers' hands from pin tags, slivers, etc., while receiving and marking goods is to be avoided. Crowding of merchandise and congestion of shoppers in various aisles are to be prevented. These are only some of the conditions that were investigated.

TABLE III  
DISPLAYING AND PUBLICITY ACTIVITIES

Advertising  
Card and sign work  
Window dressing  
Internal display  
Radio broadcasting

Table III shows the displaying activities. Here we found eye strains, posture strains, fatigue from excessive heat in window dressing, advertising and card and sign writing.

TABLE IV  
TRANSPORTING AND DELIVERING ACTIVITIES

Activity	Number of Stores (Out of 25) Engaged in Activity
Packing and wrapping .....	25
Conveying (inside) .....	22
Routing .....	19
Sheet writing .....	19
Drivers parcel delivery .....	17
Hold merchandise .....	16
Wrong address .....	16
Parcel returns .....	12
Warehouse packing and shipping .....	12
Express and parcel post .....	12

Table IV deals with 10 divisions of the transporting and delivery activities. Most of this work is done in basements where often poor light, inadequate ventilation and dust affect the health of the worker. Several young girls exposed to these conditions in one department store contracted tuberculosis while employed in the packing department. It will be seen that every store is not engaged in each activity.

Table V shows the factory and workshop activities. So many of the department stores are engaged in the various manufacturing processes that they have become factories. Fifty-four activities are listed

TABLE V

## MANUFACTURING, REPAIRING AND ALTERING ACTIVITIES

Activity	Number of Stores (Out of 25) Engaged in Activity
Men's garment altering .....	20
Women's garment altering .....	20
Shoe repairing .....	7
Fur manufacturing and repairing .....	13
Fur storing .....	11
Jewelry making and repairing .....	12
Corset making and repairing .....	9
Millinery manufacturing .....	14
Hosiery repairing .....	1
Glove repairing .....	3
Shirt making .....	4
Cloth sponging .....	1
Art needle working and embroidery .....	9
Laundry operating .....	6
Optical manufacturing .....	6
Carpet, rug, oilcloth making and repairing .....	10
Rug cleaning .....	2
Upholstery manufacturing .....	10
Shade and awning making .....	8
Mattress manufacturing .....	5
Drugs, chemicals, pharmaceuticals, toilet articles manufacturing ..	4
Toy and doll repairing .....	9
Sporting goods repairing .....	2
Radio making and repairing .....	6
Piano manufacturing and repairing .....	4
Sewing machine repairing .....	2
Picture repairing and framing .....	9
Trunk repairing .....	3
Engraving and silver plating .....	10
Card and stationery engraving .....	5
Printing .....	5
Photographing .....	5
Furniture cabinet making .....	14
Furniture finishing .....	14
Machining .....	11
Garage working:	
Automobile repairing .....	10
Woodworking .....	8
Forging .....	7
Air compressing .....	5
Vulcanizing .....	1
Running motors .....	11
Cleaning and filling cars .....	11
Sandblasting .....	2
Paint removing .....	3
Painting .....	10
Upholstering .....	6
Acetylene welding .....	5
Battery charging .....	5
Tailoring .....	6
Food manufacturing:	
Syrups .....	1
Ice cream .....	9
Coffee roasting .....	1
Tea mixing .....	1

in this table. Space will permit the citation here of only a few of the many conditions adverse to health and safety found among these activities: in the garment factories, steam, excessive heat and improper seating; in the millinery factories, escaping benzol fumes during pasting of hats; in the laundries, unhooded and unguarded machinery; in the mattress factories, escape of irritating hair dust; in the carpet and rug workshops, dissemination of wool dust during their sweeping; in the piano factories, escape of polishing dusts and of finishing lacquers and varnish fumes; in the silver plating workrooms, cyanide fumes; in the photograph dark rooms, inadequate ventilation for the removal of chemical fumes generated while developing films; in the furniture factories, polishing oils and stains; in the painting and air brushing of motor delivery trucks, poisonings from naphtha, benzol, turpentine, amyl acetate and lead; in running and testing motors of trucks, exposures to carbon monoxide; in acetylene welding, the menace to vision of the ultra-violet light.

TABLE VI

## SERVING SHOPPERS AND SERVING EMPLOYEES WITH FOOD AND BEVERAGES

Activity	Number of Stores (Out of 25) Engaged in Activity
Groceries selling .....	3
Meat selling .....	2
Baking products selling .....	3
Ice cream selling .....	9
Candy selling .....	9
Delicatessen selling .....	2
Restaurant, employees .....	18
Restaurant, customer .....	9
Tea, room .....	2
Soda fountain and luncheon .....	14

Table VI shows 10 activities involving the handling of food and drink, requiring the examinations of employees as to their freedom from infectious diseases, and the compliance with health regulations relative to the wholesomeness of and the absence of contamination from foods, etc.

TABLE VII

## SERVING SHOPPERS' AND SERVING EMPLOYEES' BEAUTIFYING ACTIVITIES

Activity	Number of Stores (Out of 25) Engaged in Activity
Barber shop .....	11
Beauty shop .....	12
Manicuring .....	13
Hair dressing .....	11

Table VII lists the barber shops, beauty shops, manicuring and hair dressing establishments. These are required to obtain a permit, after approval by the Department of Health.



Table VIII practically consists of the humane work. There are 30 items referable to health and welfare services. Thus out of the 25 stores, 11 employ physicians, 4 engage dentists, and 14 have nurses. Though 9 require medical examinations of their workers upon employment, only 1 fully reexamines them at regular stated periods. In only 2 stores are the physicians giving adequate time to health research, collection and analysis of statistical data, and supervision of environments. There is room for improvement in other humane services.

TABLE VIII

SERVING SHOPPERS' AND SERVING EMPLOYEES' HEALTH AND WELFARE ACTIVITIES

Activity	Number of Stores (Out of 25) Engaged in Activity
Doctors attending .....	11
Dentists attending .....	4
Nose and throat specialist attending .....	1
Eye specialists attending .....	2
Psychiatrist attending .....	1
References to specialists or clinics .....	6
Chiropodists attending .....	7
Nurses .....	14
Clerks .....	3
Roof-garden .....	6
Mutual Aid Association .....	9
First aid .....	25
Rest room .....	25
Recreation and entertainments .....	9
Customers' treatments .....	12
Employees' treatments .....	12
Health examination on employment .....	9
Periodic health examination .....	1
Food handlers' examination .....	20
Pensions .....	1
Loans .....	5
Sick and death benefits .....	12
Medical and surgical equipments .....	14
Statistical research .....	2
Vacations .....	15
Employment .....	25
Training schools .....	15
Continuation schools .....	10
Library .....	6
Store bulletins and magazines .....	7

Table IX comprises 23 activities relating to the maintenance, equipment and protection of the plants and buildings of department stores. Operated on a large scale some of these may be again considered as those of factories, viz., carpenter shops equipped with motor woodworking machines needing dust controlling devices; painting shops having spraying and other processes requiring protection. The cleaning, ventilating, lighting, heating and power systems require not only engineering skill but special knowledge of health and safety. The need of accident prevention was encountered in observing the

TABLE IX  
SERVING BUILDING ACTIVITIES

Activity	Number of Stores (Out of 25) Engaged in Activity
Cleaning system .....	25
Elevator and escalator operating .....	21
Elevator repairing .....	14
Glazing .....	3
Power and light and electrical repairing .....	14
Mechanical repairing .....	13
Plumbing system and repairing .....	17
Carpentering .....	17
Painting .....	17
Engineering .....	18
Fire and boiler room .....	19
Engine room .....	15
Paper baling .....	8
Incinerators .....	4
Ventilating and heating systems .....	18
Refrigerating system .....	12
Tube systems .....	15
Conveyor system .....	14
Drinking water system .....	21
Fire protection system .....	25
Property protection .....	12
Locker and dressing rooms .....	25
Warehousing occupancy .....	12

running of elevators and escalators, and in broken and worn out floors and other parts of buildings, especially in the non-selling departments. Personal contamination of drinking water due to improperly constructed fountains and common drinking utensils was observed. These are only a few of the activities upon which comments are made.

TABLE X  
ADMINISTERING FINANCE AND STATISTICS ACTIVITIES

Activity	Number of Stores (Out of 25) Engaged in Activity
Controlling .....	11
Auditing .....	16
Cashiering .....	25
Purchase and supply .....	16
Salary .....	25
Statistics .....	16
Accounting .....	25
Telephoning .....	15
Time keeping .....	16
Legal affairs .....	2
Credit controlling .....	9
Adjusting .....	13
Bureau of institutions .....	5
Mail ordering .....	10
Inspecting .....	25
Superintending .....	25
Managing .....	25
Checking .....	6
Inventories .....	25
Merchandise control .....	25

See Table XI for recommendations made.

TABLE XI

## HEALTH AND SAFETY SURVEY OF TWENTY-FIVE LEADING DEPARTMENT STORES IN NEW YORK CITY

Health and Safety Recommendations	Total	Department Stores (letter represents individual store)																									
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	
MEDICAL SUPERVISION AS TO ADEQUACY OF																											
Prevention of Illness and Injuries....	11								1		1	1	1		1	1	1						1		1	1	
Detection of Illness and Injuries....	5														1	1								1	1	1	
Correction of Illness and Injuries....	1														1												
Personnel.....	8										1	1				1	1		1					1	1	1	
Equipment.....	3														1			1							1	1	
Statistical Data.....	10										1	1	1	1	1	1	1						1	1	1	1	
Research and Follow Up.....	10																										
Health and Safety Education.....	2												1			1											
First Aid.....	3																		1	1				1			
SELF-PROTECTIVE DEVICES AS																											
Masks.....																											
Respirators.....	4										1		1				1								1		
Goggles.....	12									1			1			1	3	1						1	1	3	
Ear Protectors.....	2												1		1	2											
Apparel.....	2																										
Special Anti-Contamination Devices.....	2								1	1																	
MEANS OF SELF-CLEANLINESS																											
Adequate and Clean Lavatories.....	5								1								3									1	
Adequate and Clean Plumbing.....	16											3						4				3					
Running Hot Water.....	20			1	1						1		1		2	1		4	2			3		6	2	2	
Running Soap.....	55					1	1		2	2		5	3	3		2	1	14	2	4			1	2	2	1	
Proper Towel System.....	37	2				1	1					5	3	3		3	1	4	1	3	1		4	1	5	2	
Toilet Paper.....	14												2	4				2		3	1		1	1	1		
Proper Napkin System.....	6										1			1		1					1			1	1		
Dressing Rooms.....	1												1												1		
Proper Locker System.....	58								3	1		1	1	5	2	5	4	3			2		1	6		16	
Removal of Obscene Writing.....	1														1											2	
ANTI-STRAIN MEASURES																											
Rest and Relief Periods.....																											
Recreation and Rest Room.....	2																										
Rest Devices.....	10												1	1					2	3							
Postural Adjustments.....	7																						1	1		3	
Proper Seats.....	36																				1						
Sound-Deadening Devices and Noiseless Machines.....	37								1	1	1	5	2	3	4	2	4	4						6	3		
Relief of Special Organ or Muscle Strain.....	9										4	4	1	2	2	2	5			1				7	4	5	
Reduction of Working Hours.....	1									1				2			2	2						1	1		
NON-CONTAMINATION OF FOOD AND OF DRINKING WATER																											
FOOD																											
Storing, Displaying.....	12			1						1												2		3	4	1	
Preparing.....																											
Serving, Eating.....	23																										
Waste Disposal.....	1										1			2	2		5	1	1					5	1	4	
WATER																											
Storage Tanks.....	2																										
Fountains.....	13												2														
Cups and Glasses.....	136	1		1		1	1		1	1		1	6	7	2	1	4	3	3				2	10	26	38	
Utensil-Cleaning Methods.....	19																							2	10	3	

Continued on Next Page

Table X shows 20 activities in administration finance and statistics. These are usually located away from the selling and other operating fields. Defects of ventilation and lighting, as well as strains from bad posture, and noises from accounting machines and cashiering processes were found. In the tube rooms of one store, there were 177 women,

TABLE XI (Cont.)

## HEALTH AND SAFETY SURVEY OF TWENTY-FIVE LEADING DEPARTMENT STORES IN NEW YORK CITY

Health and Safety Recommendations	Total	Department Stores (letter represents individual store)																									
		A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	
SURROUNDING CLEANLINESS AS TO																											
Windows.....	6											1		2				2				1					
Ceilings.....	15											7	1			2		2	1					3			
Walls.....	10															4		2						3			
Aisles, Floors.....	40											3				6	2	12	1	1			1	6	2	6	
Stairways.....	2																	1									
Fixtures.....	68										3	3	2	1	21	2	10	1	1	1	1	1	2	3	6	11	
Anti-Spitting Control.....	2															2											
Cleaning Methods.....	6											1		1	2	2											
Insect Extermination.....	3							1																		2	
Accumulation of Rubbish, Etc.....	20										1		2			5	2	2					1			7	
SPECIAL CLEANING AND STERILIZATION FOR																											
Barber Shop.....	4										1	1			1											1	
Beauty Shop.....	10											1						1			1					2	
Toilet Articles—Brushes.....	15										1	1	1	1	1		1	1	1	1	1	1	1	1	1	1	
Mattresses, Pillows.....	2										1													1			
VENTILATION AND NON-VITIATION OF AIR																											
General Control.....	41	1		1						2	1	1	3	1	1	9	3	8	1	4				4		1	
Heating Control.....	8										1	2				2	3										
Control of Draughts.....	8				1		1					1	1			1	2						1				
Special Control (in Processes) of																											
Dusts.....	43				1					5		2	6	9		9	1							2		8	
Fumes.....	47				1		1	1	6	1	3	5	8		4	3	3	1					4			6	
Gases.....	9										1	1	1	2		1	2	1									
Vapors.....	11				2	1	2		1							1	1							1			
Poisons.....	1																								1		
Bacteria.....																											
Excessive Heat.....	22				2		2	1	5	1	1	2			3		1						1	2	1		
Dense Smoke.....	2											1			1												
Overcrowding (Control).....	7											2				1	2						1	1			
PROPER LIGHTING AND LIGHT CONTROL AS TO																											
Natural Lighting.....	7															4		1					2				
Artificial Lighting.....																											
Quantity.....	20									1	2	1		2	6		3						4			1	
Distribution.....	28			1	1			2				1	3	1	6	2							2	3	6		
Quality.....	33					1					3	1	1	1	8		1	2		1	1	2	4	1	7		
Dangerous Light Rays in Processes..	8										1	2	2	1	2												
SAFETY AS TO																											
Good Repair.....	61	1										9		1	7	5	7	3			1	3	8	4	15		
Placement.....	4														1										3		
Guarding.....	25							1	1	1	3		1	1	6	2							1	4	4		
Transportation.....	4										1				1									2			
FIRE PREVENTION AS TO																											
.....	5											2						1				1	1				
.....	15										1		1	1	1	2	5	1					3				
PROCURING OFFICIAL PERMITS.....																											
TOTALS.....	1225	7	1	6	13	5	7	17	37	9	64	91	69	40	160	77	130	23	24	14	10	15	117	90	188	11	

ranging from 18 to 25 years of age, engaged in the processes of receiving the money and slips of purchases from various departments, and returning the change and slips. On entering one of these rooms the writer was reminded of the noises of the old fashioned celebration of Independence Day. These bombardments were caused by the impact of the carriers containing the money and slips as they emerged from

TABLE I

PERCENTAGE OF *B. prodigiosus* IN THE SEGMENTS OF THE GASTROINTESTINAL TRACT 2 HOURS AFTER INGESTION WITH THE RESPECTIVE FOOD VEHICLES

	Fasting	Meat	Meat and Infected Meat Juice	Infected Meat
Stomach	0	10	30	90
Duodenum	0	20	30	60
Jejunum	0	20	50	70
Upper half Jejunum	trace	30	50	80
Lower half				
Ileum	10	70	80	100
Cecum	15	80	90	100

cecum at time intervals after feeding are indicated. It is apparent that the meat diet in some ways inhibits the bacterial destroying power of the upper intestinal tract. The changes that take place within the stomach, duodenum and cecum of dogs fed with plain milk, alkaline milk and *B. Shiga* proteins (to produce diarrhea) are shown in Figures I to V inclusive (see Arnold').

With this brief review of a few of our previously reported experiments as a background, we wish to call attention to the importance of the food vehicle in experimental food poisoning conditions. Without going into detail, we have found it necessary to use the same age group of dogs for comparative experimental work. For the experiments to be reported, young dogs within the 6-10 months old age group were used. Each experiment to be reported represents an average of the results obtained upon 12 dogs. *B. prodigiosus* was given to each animal with the food. The dogs were killed in the ether chamber 2 hours after feeding. The distribution of the test bacteria was determined by taking specimens from the various levels of the gastro-

TABLE II

PERCENTAGE OF *B. prodigiosus* IN THE SEGMENTS OF THE GASTROINTESTINAL TRACT 2 HOURS AFTER INGESTION WITH THE RESPECTIVE FOOD VEHICLES

	Fasting	Bread and Broth	Bread and Infected Meat Juice	Meat alone
Stomach	0	0	0	10
Duodenum	0	0	0	20
Jejunum	0	0	0	20
Upper half Jejunum	trace	20	20	30
Lower half				
Ileum	10	30	20	70
Cecum	15	20	30	80

intestinal tract within 5 minutes after death. In previous reports we have shown that the distribution of *B. enteritidis*, *B. typhosus* and *B. pyocyaneus* is the same as that found for *B. prodigiosus*. The latter organism has been used to simplify the technical procedures.

Table I shows the differences in the distribution of the test micro-organism 2 hours after administration in fasting, meat meal, meat plus enteritidis—infected meat juice (heated 100° C. for 1 hour) and enteritidis—infected meat. Table II shows results obtained when bread moistened with broth is fed. Table III gives a résumé of the results obtained by milk feeding. Figures I, II and III illustrate graphically the contents of the preceding tables.

TABLE III

PERCENTAGE OF *B. prodigiosus* IN THE SEGMENTS OF THE GASTROINTESTINAL TRACT 2 HOURS AFTER INGESTION WITH THE RESPECTIVE FOOD VEHICLES

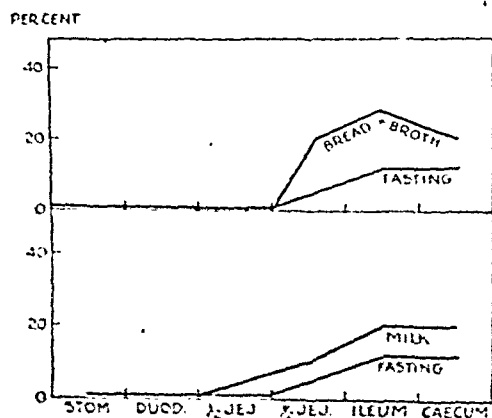
	Fasting	Milk	Milk and Infected Meat Juice	Infected Milk	Meat alone
Stomach	0	0	0	0	10
Duodenum	0	0	0	0	20
Jejunum	0	trace	10	0	20
Upper half Jejunum					
Lower half Jejunum	trace	10	10	10	30
Ileum	10	20	20	20	70
Cecum	15	20	30	10	80

Even the enteritidis-infected meat did not cause diarrhea. We wish to bring out here that changes in the intra-intestinal bactericidal power are demonstrable following the ingestion of various foods. Meat causes a change in the intra-intestinal endogenous bacterial flora. The duodenum and jejunum contain a bacterial flora similar

to that found in the ileum and cecum. The power to destroy exogenous bacteria is diminished.

The gastrointestinal tract is changed in such a manner after the ingestion of a high protein meal that it is more sensitive to certain irritants than when some other foods are eaten. This report deals with heated enteritidis-infected meat only. The presence of viable *B. enteritidis* has been excluded. It is thought

FIGURE III



that most of the *Salmonella* group responsible for food poisoning outbreaks in man are derived from animal sources.

Milk and milk products should be subjected to such infectious material more than most foods. It is well known that milk is seldom the vehicle of the causative agent of food poisoning. From our experimental results it would seem that the toxic substances present in heated enteritidis meat cultures are not irritants to the gastrointestinal tract when added to milk. We have previously shown<sup>1</sup> that unheated enteritidis-infected milk was not a gastrointestinal irritant in our experimental animals.

The food vehicle in food poisoning outbreaks plays an important rôle. We have called attention to some of the changes that take place in the host that accompanies an increased susceptibility to gastrointestinal irritation.

#### REFERENCE

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## Division of Maternity and Child Hygiene, Chile

IN order to enlarge the scope of the work with mothers and young children in Chile, in accordance with the social insurance law of 1924, the Ministry of Social Welfare of Child (Ministerio de Previsión Social) issued regulations on November 11, 1929, for the establishment of a Division of Maternity and Child Hygiene (La Sección Maternal y del Niño). This division will centralize the supervision over all maternal and child hygiene agencies, coördinate the work of the agencies receiving Government subsidies, give information to private agencies, and organize health work for the working mother and her child.

The Division is to be in charge of a medical director, a specialist either in obstetrics or in pediatrics, who will be assisted by the previously established Superior Council on Maternal and Infant Welfare. The duties of the director will be:

1. To formulate rules for the work of the maternal and child health agencies
2. To supervise the work of the medical inspectors
3. To study and to suggest the necessary child health measures
4. To introduce uniform statistical methods in the child-caring institutions

The Division of Maternity and Child Hygiene will carry out its work by means of "children's bureaus" (oficinas del niño), one to be established in each of the ten cities which are the seats of the district hospitals. The functions of these bureaus will be to give instruction in prenatal and postnatal care; protection of the mother during pregnancy, confinement, and the nursing period; and aid to expectant mothers and to children.

The staffs of the children's bureaus will consist of pediatricians, obstetricians, and visiting nurses.—*Diario Oficial de la Republica de Chile*, Santiago, Nov. 29, 1929, p. 6611.

# Industrial Methyl Chloride Poisoning\*

HERMAN M. BAKER, M. D.

*Evansville, Ind.*

THE growing complexity of modern industry is continually thrusting forward problems in the identification and management of new industrial diseases. With the rapid development of the refrigeration industry there has been brought to our attention a group of hazardous gases. I shall confine myself to a brief discussion of one of these, methyl chloride.

While extensively used in the chemical industries and as a local anesthetic, this gas has received little attention in the literature of industrial hygiene, and even toxicologists have failed to consider it of sufficient importance to require more than passing notice. In 1876, Eulenberg<sup>1</sup> reported the toxic action of this gas. In 1879 a committee on anesthetics of The British Medical Association<sup>2</sup> investigated it and reported a narcotic action. It was again reported by Kionka<sup>3</sup> in 1900. The first cases of industrial poisoning were those of Gerbis,<sup>4</sup> who in 1914 reported 2 cases. In 1923, Roth<sup>5</sup> reported a series of cases occurring in industry, and Schwarz in 1923<sup>6</sup> 10 cases with 1 death. Henderson and Haggard<sup>7</sup> issued a monograph on poisonous gases and the treatment of such poisonings in 1927, and under the group of "more toxic anesthetics" methyl chloride is described at some length. The writer<sup>8</sup> reported a series of cases of poisoning occurring in industry in 1927, and recently Kegel, McNally and Pope<sup>9</sup> report 29 cases of poisoning with methyl chloride in Chicago, of which 10 died. During the early months of 1929 the U. S. Bureau of Mines<sup>10</sup> conducted a series of experiments to determine the toxicity of methyl chloride. Guinea pigs were exposed to vapor concentrations of 41.5 per cent for 8 minutes down to those of 0.07 per cent for 810 minutes. This work is being continued and further data will no doubt be available soon.

I have the permission of Dr. H. M. Kauffman<sup>11</sup> of Evansville, Ind., to report 75 cases observed by him from 1926 to 1929. These were all among employees of a refrigerator manufacturing plant. There were no deaths, or severe sequelae.

\* Read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 4, 1929.



The condition most frequently confused with methyl chloride poisoning in the Chicago cases was food poisoning. It will be borne in mind that nearly all of these cases occurred in small apartments and were caused by leaks in refrigeration systems. In my experience the most frequent mistake was that the condition was called influenza or encephalitis, as there happened to be an epidemic of influenza present at the time most of these cases developed. It should be differentiated from ethyl and methyl alcohol intoxication. In the latter case the difficulty would be great; also poisoning from carbon monoxide, from the heavy metals, and epidemic meningitis.

In view of the Chicago experience it would be well for health authorities and hospital attendants to check the histories of cases admitted with a diagnosis of food poisoning, to learn whether there had been exposure to refrigerant gases. The knowledge that an individual is employed in the refrigeration industry would be of the utmost importance in differential diagnosis.

#### TREATMENT

The patients should be hospitalized. Alkaline balance should be established. If the patient is unable to swallow, this should be done by administering alkalis by rectal drip or intravenously. In severe cases, oxygen should be administered until the ketonic odor has disappeared from the breath. If there are convulsions or similar nervous manifestations, bromides may be used in large doses. Under no circumstances should chloral or chloroform be used. Special symptoms should be met by appropriate treatment. I found strychnine to be of value in after-treatment, and Dr. Kauffman states that he considers this the most valuable drug he has used. The most important factors in treatment are early recognition of the disease and prompt removal from exposure to the gas.

#### SEQUELAE

With the exception of one case which developed foot-drop, I saw no permanent damage. Nearly all cases complained of insomnia lasting from several days to three weeks after an attack. Several developed fine tremors which lasted a week or two after all other symptoms had disappeared. Anorexia was very common. Kegel, *et al.*, report severe sequelae in several cases, among them ataxic gait, aphasia, incoördination of legs, disturbances of vision, emotional instability, etc. It will be borne in mind that these were all severe, acute cases which had received, no doubt, massive doses of the gas, while my cases were of the more chronic type.

## CONCLUSIONS

Industrial methyl chloride is absorbed through the respiratory tract in amounts sufficient to intoxicate workmen, unless special precautions are taken to guard against this danger.

It is a toxic agent, slowly removed from the body, and therefore becomes cumulative in its action.

It can be detected in the urine as formate.

If it does not cause death it may well produce permanent crippling injury to the various organs and especially the nervous system.

Poisoning by methyl chloride should be thought of in all workers in the refrigeration industry when this gas is used as the refrigerant, and it should be considered in all people coming to physicians or hospitals with any of the above symptoms if there is a possibility of exposure in their homes or in places of occupation.

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# EDITORIAL SECTION

*Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.*

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## A NATIONAL MOVEMENT FOR CLEANER CITIES

THERE are three sanitary services which are indispensable to cities and towns as we know them in America today.

The most important and the first to be built is the water supply. Considerations of health and decency require that there shall be an abundant provision of clean, pure water for every house, to say nothing of what is demanded by industry. We have here an engineering undertaking which has been highly developed from the scientific and technical standpoints. The works which are required are customarily built after extensive investigations have been made and plans and estimates carefully prepared. Frequently men who have become recognized for expert ability in this specialty are called upon to act in a consulting capacity, so that there shall be no serious fault with the system after it is actually constructed.

The second indispensable service, and one which is generally introduced soon after the water supply, is sewerage. This is also an engineering undertaking and if it is well designed the question of final disposition of the liquid wastes is provided for. In sewerage we have a service which bears a resemblance to water supply in certain particulars, but in the past it has been too common for a restricted view to be taken of the ultimate necessities in the way of a plan which will adequately meet the requirements of the future, to say nothing of disposal. As a result, cities are frequently compelled to introduce extensive changes in their sewerage arrangements, including main drainage and disposal works, the object of which is to collect to a central point the drainage of the houses and streets and treat it in a way which

will make it possible to discharge the effluent into the natural water courses, without danger or offense.

The third sanitary service comprises the cleaning of the surface of the streets and the collection and disposal of the solid wastes of domestic and industrial origin. We have here a subject which is markedly different from the water supply and sewerage in many particulars. The money invested in the plant is comparatively small and the number of men employed, on the other hand, large. In equipment and methods a great deal is left to the experience and judgment of those who do the work. This service is almost always unpopular with the citizens. It is not too much to say that in nothing done by the municipality is there such an opportunity to waste or save money. The ways in which the garbage and other refuse are collected are often primitive and insanitary in the extreme, and the disposition of them unsatisfactory.

Here is a matter which urgently demands attention. Those who have given it qualified study are of the opinion that if attention is properly focussed upon it and a national movement can be started to improve the cleaning services of our cities and towns, better methods and equipment can be developed which will not only result in greater cleanness but decided economies. Certainly recent European practice warrants this opinion:

At the annual meeting of the American Society of Civil Engineers this matter was discussed by the Sanitary Engineering Division of that association and a proposal was made and favorably acted upon requesting that a committee of the society be created to coöperate with accredited representatives of other interested national organizations to look into the whole subject of municipal cleansing with the purpose of recommending better procedures, apparatus, and cost accounting. This is believed to be the first attempt upon a broad scale to bring system and order to a sanitary service which means so very much to the public health and welfare of our American communities.

## STREPTOCOCCI, TONSILS AND RHEUMATISM

THE bacteriologist has no more difficult task than to classify the streptococci. That they are among man's chief enemies no one doubts. It is equally certain that they are widespread and that many different types are found. There are constant attempts to connect some particular streptococcus with a given disease, but practically always just when it seems that something has been proved, other workers show that the evidence will not stand close investigation.

The streptococcus has been incriminated as the cause of rheumatism for a long time, and the tonsils have been suspected as being the chief portal of entry. Based on this belief, tonsillectomy has been recommended and carried out in thousands of cases. There is no question that streptococci can be isolated from the tonsils in practically all cases of rheumatism. Some have believed that the toxic effects are due to the absorption of poison from the tonsils, while others have held that the organism itself gains entrance to the blood stream, which, in a way, seems to be borne out by the occurrence of valvular disease of the heart following rheumatism, and by the growths found in rheumatic joints. Certain observers have produced arthritis and endocarditis in experimental animals by inoculation with streptococci from various sources, some rheumatic and some not, while others have shown that streptococci from non-rheumatic cases produce arthritis often indistinguishable from that due to the so-called streptococcus rheumaticus. There can be little question that streptococci have been found in rheumatism which are identical with those often found in non-rheumatic cases.

In a recent piece of work,<sup>1</sup> 190 strains of streptococci were isolated from 50 cases of rheumatism, and 157 from 48 non-rheumatic. These various strains were carefully compared and identified as far as possible. The most generally accepted classification is hemolytic and non-hemolytic. The percentages of these varieties found in the two classes of cases were almost identical, varying only by hundredths of a per cent. There was a slightly greater difference, though not at all a significant one, between the green and non-green types, and the same may be said of the four other named types identified. Even the number of streptococci per tonsil was very much the same. The very natural conclusion was reached that streptococci from rheumatic tonsils do not vary greatly from those in non-rheumatic cases. Even on Crowe's medium, which is being used in England as a method of classification, it was impossible to differentiate plates made from rheumatic and non-rheumatic cases.

One naturally turns from these findings to the question of removal of the tonsils for the cure and prevention of rheumatism. This has been strongly advocated by many observers, especially by Poynton and Paine, who were among the first to demonstrate what they considered a special coccus in rheumatic tonsils, and to connect it with the disease. From the practical and clinical standpoints there can be little question that removal of enlarged and diseased tonsils benefits most children, and in spite of the uncertainty concerning classification, there is little doubt that repeated or continued low-grade in-

fection of these glands cannot but be injurious. The work under consideration seems to show conclusively that as far as this is concerned, the particular type of streptococcus is not important, but none the less, the authors consider that the removal of the tonsils is "probably a valuable prophylactic and therapeutic measure."

We have in these columns reviewed three volumes devoted entirely to consideration of the streptococci,<sup>2</sup> which show that classification of these organisms is far from being an accomplished fact. The recent findings in regard to the streptococci supposed to be specific for scarlet fever and rheumatism also demonstrate this.<sup>3</sup> Clinicians, pathologists and bacteriologists alike are glad to have any facts which will help them concerning this puzzling problem.

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## RESPIRATORY DISEASES AND DISABILITY

A REPORT just issued by the U. S. Public Health Service of sickness and non-industrial injuries occurring in some 35 sick benefit associations and company relief departments, 1921-1928 inclusive, emphasizes two points of which all health officers and sanitarians are aware, but the significance of which the public generally does not seem to grasp.

Among every 1,000 men employed, there were annually 103.5 cases of disability which lasted for 8 days or longer. The respiratory diseases were responsible for 42.4 per cent of the total, though even this does not include the full amount. Among this group, influenza or grippe was the most common affection, amounting to 57.5 per cent of the cases in 1928, as against 50 per cent during the entire period studied. The bright spot is the decreasing influence of tuberculosis, which was lower in 1928 than in any of the years studied, a finding which accords with the figures for the general population.

The control of respiratory diseases is the blackest spot in our preventive program. We have made comparatively little headway in controlling the most common of the contagious diseases. One great reason for this is that human conduct is involved—of all the factors involved in the spread of contagion the most difficult to control. In spite of the disfigurement of our public buildings, street cars and other public conveyances by signs against spitting, the American public still continues to expectorate widely, profusely and frequently, in addition

to which comparatively few people cover their noses and mouths when sneezing or coughing. Even physicians and sanitarians are far from being guiltless in this respect.

In many parts of our country, but especially in the North, for 3 to 5 months of the year, respiratory infections are met with daily and hourly. Coughing and sneezing are the order of the day. In spite of the school surveys demonstrating the large part played by common colds in absenteeism both among pupils and teachers, no one has had the courage to advocate removal from classes on account of the common cold. If this were done, classes would frequently be more than decimated. Like the poor, colds and sore throats are always with us, and we have learned to regard them as trivial affections; yet who knows the vast amount of injury which they inflict on the individual and in the aggregate? We recognize their decidedly pernicious influence on certain diseases like tuberculosis, but in ordinary life we pay entirely too little attention to them.

No one knows the cause or causes of the ordinary cold, yet no one has escaped its clutches. All studies as to the cause of colds have been disappointing, misleading or contradictory. In spite of this, the biological houses have put out vaccines of various sorts, mostly of the gunshot prescription type.

In view of our present knowledge, it seems that campaigns against promiscuous coughing and sneezing must continue; that the droplet infection theory of Flügge must be emphasized in our teaching; that we insist upon the avoidance of exposure; and that children be taught at home as well as in the schools the necessity of protecting the mouth and nose when sneezing and coughing are necessary.

## A New Journal

WE extend a cordial welcome to *Municipal Sanitation*—a Journal for the Practical Sanitary Official, the first issue of which has just appeared. The title explains its object.

Abel Wolman, who is Chairman of our Committee on Meetings and Publications, and also editor of several other journals, is the Editor. George W. Fuller, President of our Association in 1929, is Chairman of the Advisory Board.

The first number is extremely interesting, containing material of value not only to the readers for whom it is primarily intended, but to all who are interested in municipal sanitation.

The printing and make-up are excellent, and the illustrations good. We wish for it all success.

# ASSOCIATION NEWS

## PLANS FOR THE FORT WORTH MEETING

**A**NNOUNCEMENT is made of the appointment of A. H. Flickwir, M.D., Director of Public Health and Welfare of Fort Worth, as Chairman of the Local Committee for the Fifty-Ninth Annual Meeting. Dr. Flickwir was formerly Health Officer of Houston and has been President of the Texas Association of Sanitarians. He is well known to many members and Fellows of the Association. Although the Local Committee has not yet been completely organized, announcement has been made of the following appointments:

### FORT WORTH LOCAL COMMITTEE

A. H. Flickwir, M.D., *General Chairman*  
E. D. Hopkins, *Secretary*  
John Stanley, *Treasurer*  
M. C. Anderson and C. M. Davis, *Finance Committee*

### CITIZENS' COMMITTEE

Mayor William Bryce, *Chairman*  
M. E. Gilmore, M.D., *Vice-Chairman*  
I. C. Chase, M.D., *Vice-Chairman*  
J. C. Anderson, M.D., *Honorary Vice-Chairman*

### RECEPTION COMMITTEE

Walter B. Scott, *Chairman*  
J. C. Anderson, M.D., *Honorary Vice-Chairman*

### ENTERTAINMENT COMMITTEE

Truman Terrell, M.D., *Chairman*  
D. W. Carlton, *Secretary*

### PUBLICITY

G. W. Luckey, M.D., *Chairman*  
Roscoe Ady, *Vice-Chairman*

### REGISTRATION

Chester Hollis

### MEETING ROOMS

L. A. Quigley, *Chairman*

### INSPECTION TRIPS

Dudley Lewis, *Chairman*  
W. O. Jones, *Secretary*

### LADIES' ENTERTAINMENT

Mrs. Henry Trigg

### MEMBERSHIP COMMITTEE

H. K. Read, M.D., *Chairman*  
E. G. Eggert, *Secretary*

### HOTELS

Jack H. Hott, *Chairman*

### EXHIBITS

Tom Bond, M.D., *Chairman*  
J. W. Ridgway, *Vice-Chairman*

### INFORMATION

C. F. Hayes, M.D., *Chairman*

### EDUCATIONAL EXHIBITS

Holman Taylor, M.D., *Chairman*  
Victor M. Ehlers, *Vice-Chairman*

At the first meeting of the Sub-committee on Annual Meeting Program which was attended by the Chairman of the Local Committee, it was decided to allot to each section two individual sessions and two joint sessions. The committee, expressing the sentiment of many members, recommended that the greatest possible emphasis be placed on joint sessions at Fort Worth. The committee also tentatively approved three general sessions, including the opening general session on Monday evening, a luncheon session for members and Fellows at which the reports of the four standing committees and the Executive Board would be presented, and a session following a banquet. Two topics for joint sessions were recommended: (1) the anti-diphtheria program, and (2) meningitis and undulant fever.

Program regulations following those in force in past years were approved, and it was decided to continue the policy of scheduling papers in accordance with the time-table plan which was begun at the Chicago meeting.



The date of April 1 was designated as the closing date for the first tentative program, and July 1 for the preliminary program. September 15 was designated as the last date for accepting material for the final program.

The Executive Secretary reported conferences with Dr. Villanueva, the Chief of the Federal Health Service of Mexico, in which Dr. Villanueva promised to send to the Fort Worth meeting a delegation of Mexican public health workers.

A tentative list of trips to places of general and scientific interest was approved. This list includes trips to packing plants, sewage disposal and water purification plants, airports, hospitals, health centers and the local health department.

Headquarters for the meeting will be at the Hotel Texas and the majority of the meetings will be held at this hotel, as will also the educational and technical exhibits. Information concerning hotel accommodations in Fort Worth and railroad facilities will be published in a later issue of the JOURNAL.

#### DATES CHANGED FOR WESTERN BRANCH MEETING

William P. Shepard, M.D., Secretary of the Western Branch of the American Public Health Association, announces that the dates of the special meeting of the Association to be held at Salt Lake City have been changed to June 12 to 14. This will enable the state health officers in the western states to proceed directly to Washington for the Surgeon General's Conference to be held the following week and also for the Conference of State and Provincial Health Authorities.

This will be the first opportunity in several years for many of the western members to attend a meeting of the association, and it will undoubtedly be the most representative public health meeting ever held in that region.

The western aspects of the tuberculosis problem will be covered in papers by Dr. Gerald B. Webb of Colorado Springs and Dr. H. W. Hill of British Columbia. A tentative session has also been scheduled on the public health aspects of the Boulder Dam project. It is believed that this will be the first conference held on this subject.

Further details concerning the program may be obtained from Dr. W. P. Shepard, Assistant Secretary of the American Public Health Association at 600 Stockton St., San Francisco, Calif.

#### INTERNATIONAL CONGRESSES AT DRESDEN

In connection with the International Hygiene Exhibition to be held in Dresden this summer there will be held a number of notable scientific congresses of interest to public health workers, among which are the following:

- German Municipal Health Officials
- German National Organization for Public Health Education
- German League for Public Health
- German Society for School Hygiene
- German Society for Industrial Hygiene
- German Central Committees for the Control of Tuberculosis and Cancer
- German League for Mental Hygiene

The Executive Council of these congresses has extended an invitation to the American Public Health Association, which invitation has been accepted, to send delegates to these congresses. The delegation will leave New York on June 14, which date will permit attendance also at the meeting of the Royal Sanitary Institute to be held in Margate, England, June 21 to 28, and will return to New York about August 4. Further details of the arrangements will be communicated to the members.

An invitation has also been received from Dr. Calmette for these delegates to visit the Pasteur Institute, and to attend the International Congress of Micro-biology to be held in Paris at the end of July.

# AMERICAN PUBLIC HEALTH ASSOCIATION

## EXECUTIVE BOARD MEETING

THE Executive Board of the Association met in New York on February 2 with Drs. Bishop, Hassler and Vaughan absent.

*Reports of Standing Committees—* Reports were received from the Committee on Fellowship and Membership, Committee on Meetings and Publications and Committee on Administrative Practice.

*Report of Treasurer—*The Treasurer presented the report of the auditor, which showed the situation of the Association as of December 31, 1929, to be as follows:

### INCOME, JANUARY 1, 1929, TO DECEMBER 31, 1929

Membership Dues	\$29,684.13
American Journal of Public Health and The Nation's Health	35,400.57
Syndicated Public Health Bulletin	4,489.00
A. P. H. A. Publications (net profit)	4,093.80
Other Publications (net profit)	2,285.67
1929 Annual Meeting Exhibits	15,783.50
Surveys	20,267.15
Consultant Service	1,823.34
Grants:	
Administration—	
Com. on Adm. Prac.	19,581.34
Rural Study	12,473.07
Hospital Study	603.63
Laboratory Study	96.13
Health Conservation Contest	8,220.78
Extension of Registration Area	2,834.71
Chautauqua Health Program	14,071.46
Interest and Discounts	1,403.12

Total General Fund Income

\$173,111.40

### EXPENSE, JANUARY 1, 1929, TO DECEMBER 31, 1929

#### Principal Operating Budget:

Administration	\$22,871.61	
Membership and Promotion	25,807.23	
American Journal of Public Health and The Nation's Health	19,054.44	
Syndicated Public Health Bulletin	4,126.87	
Contingent	2,108.80	
1929 Annual Meeting Expense	6,044.56	
1929 Annual Meeting Exhibits	4,682.01	84,695.52

#### Committee on Administrative Practice:

Administration	\$19,901.48	
Field Service	17,226.80	
Rural Study	12,473.07	
Hospital Study	603.63	
Laboratory Study	96.13	
Health Conservation Contest	8,220.78	58,521.89

Chautauqua Health Program	14,071.46
Committee on Registration Area	2,834.71

Total General Fund Expenses	\$160,123.58
Plus Reserve for Uncollectible Accounts Receivable	550.03

Net General Fund Expenses \$160,673.61

### ASSETS—GENERAL FUND

Cash	\$24,060.43
Accounts Receivable	5,555.65
Investment Securities	18,083.25
Inventories:	
Sundry Publications	3,458.11
Office Equipment	1,869.02
Rural Study Equipment	756.15
Deferred Expense	1,884.63

Total General Fund Assets \$55,667.24

## LIABILITIES—GENERAL FUND

Accounts Payable	\$5,923.79	
Accounts Receivable—		
Credit Balances	55.36	
Prepaid Membership		
Dues	9,089.26	
Prepaid Subscriptions	3,167.91	
Prepaid Advertising	156.00	
Reserve for Rebates to		
Affiliated Societies	1,000.00	
Unexpended Balances		
on Grants:		
Rural Study	5,258.83	
Hospital Study	896.37	
Laboratory Study	903.87	
Health Conservation		
Contest	9,279.22	
Chautauqua	352.67	
Committee on Regis-		
tration Area	717.32	
Total General Fund Lia-		
bilities		36,800.60
Net Asset Value General		
Fund		\$18,866.64
Sedgwick Medal Fund:		
Assets	\$2,515.75	
Liabilities	343.61	
Net Asset Value Sedgwick Medal		
Fund		2,172.14
Net Asset Value Life Member-		
ship Fund		2,063.89
Total Net Asset Value as of De-		
cember 31, 1929		\$23,102.67

The Executive Secretary presented estimates of income for 1930 and the budget was approved as follows:

General Administra-	
tion	\$44,196.00
Committee on Fellow-	
ship and Member-	
ship	13,056.00
Committee on Meet-	
ings and Publications	58,760.00
Committee on Admin-	
istrative Practice	90,480.00
Committee on Re-	
search and Standards	5,000.00
Total	\$211,492.00

*West Coast Branch*—At the recommendation of the Executive Secretary the Board approved the appointment of William P. Shepard, M.D., as Assistant

Secretary of the American Public Health Association at a salary of \$1.00 per annum, to be stationed on the west coast. A first appropriation of \$400 was made for the purposes of this office.

*Committee and Other Appointments*—The following appointments were made to special committees of the Association previously authorized:

*Committee on Federal Health Legislation*

*Chairman*, Lee K. Frankel, Ph.D.

James A. Tobey, Dr.P.H.

M. J. Rosenau, M.D.

S. J. Crumbine, M.D.

*Committee to Coöperate with Director of the Census*

*Chairman*, Charles V. Chapin, M.D.

*Secretary*, Haven Emerson, M.D.

Irving Fisher, Ph.D.

*Committee to Extend the Association's Influence in South and Central Americas*

*Chairman*, Hugh S. Cumming, M.D.

Professor E. O. Jordan

John A. Ferrell, M.D.

Professor E. O. Jordan, Robert Spurr Weston and William H. Park, M.D., were appointed as members of the Sedgwick Memorial Medal Committee. Professor C.-E. A. Winslow was appointed delegate and Lee K. Frankel, Ph.D., alternate to the Joint Committee on the Grading of Nursing Schools.

*Section Committees*—The Executive Secretary reported that 44 replies had been received to the inquiry addressed to the 59 Section committees with reference to their scope and status, and the Board confirmed the appointment of these 44 committees and appointed a special committee of 3 to study with the Executive Secretary the relationship of these committees to the work of the Association and to present recommendations for allocation of these committees under the four standing committees of the Association.

*Committee on Research and Standards*—Abel Wolman was designated as *Chairman* of the Committee on Research and Standards.

*Representation at Foreign Meetings*

—The Chairman of the Board was authorized to appoint delegates to attend the following meetings to be held in Europe this summer:

International Congresses on Hygiene, Dresden, Germany, May to Oct.

Congress of the Royal Sanitary Institute, Margate, England, June 21–28

Congress of the Royal Institute of Public Health, Portsmouth, England, June 4–9

## ARTHUR TOMALIN

Arthur Tomalin, a member of the Public Health Education Section of the American Public Health Association, and Associate Secretary of the Association from June, 1927, to June, 1928, died on February 8 at his home in Mountain Lakes, N. J.

Mr. Tomalin came to the A. P. H. A. from *Pictorial Review* where he had been managing editor. Previous to this he was director of publications of the American Child Health Association. There he made a notable contribution to public health periodicals in developing the splendid though short lived *Child Health Magazine*. Mr. Tomalin was considered one of the most capable magazine executives of the day. His most important contribution to the A. P. H. A. was the present format of the JOURNAL.

Mr. Tomalin had an abundant measure of those lovable human qualities that endeared him to all who were associated with him. His loss will be felt by a host of friends made in many fields during an exceptionally active life.

## HEALTH SURVEY OF WASHINGTON, D. C.

At the invitation of the Washington Council of Social Agencies, representatives of the Committee on Administrative Practice of the American Public Health Association are undertaking a health and hospital survey of the City of Washington. The chairman of the local health committee of the Council of Social Agencies is Dr. Paul Preble, U. S. Public Health Service.

The survey has the approval of the local health department and while similar to studies made in other cities will include special studies of public health nursing, social hygiene, and certain aspects of hospital administration. Representatives from the National Organization for Public Health Nursing and the American Social Hygiene Association will investigate problems in their respective fields, and questions relating to hospital administration will be considered by specialists suggested by the American Hospital Association.

## NEW MEMBERS

Charlotte Addison, B.Sc., Pittsburgh, Pa., Director, Nutrition Department, Western Pennsylvania Hospital

Mabel Baird, Hartford, Conn., Field Secretary, State Tuberculosis Commission

Franklin W. Barrows, M.D., New Rochelle, N. Y., School Medical Supervisor, Board of Education

Alga M. Beck, Brooklyn, N. Y., Teacher, Maxwell Training School

W. D. Bishop, M.D., Greenville, O., Health Commissioner

Miranda Bradley, R.N., Riverhead, N. Y., County Supervising Nurse

John Brown, Jr., M.D., New York, N. Y., Secretary, Department of Physical Education, National Council Y. M. C. A.

Freda M. Caffin, San Francisco, Calif., Field Supervisor, Stanford Social Service

K. Frances Cleave, Detroit, Mich., Director, DuBois Health Center

Alice Cunningham, Lodi, N. J. (Assoc.)

Mrs. Sigrid M. Dudley, Menasha, Wis., School Nurse

Charles Eastman, D.V.M., Los Angeles, Calif., Junior Veterinarian, Los Angeles County Health Department

Louis E. Eslick, M.D., Rockwell City, Ia., Chairman, Public Health Committee of the City Council

Dr. Juan Farill, Mexico City, Mex., Chief Quarantine Officer

Dr. J. M. Farrell, Wichita Falls, Tex., Chief City Sanitary Inspector

Florence E. Ferguson, R.N., Lemars, Ia., School Nurse  
 Morgan B. Finley, San Benito, Tex., County Sanitarian  
 Roy P. Forbes, M.D., Denver, Colo., President, Denver Public Health Council  
 Mary G. Fraser, R.N., Miami, Fla., Supervisor of Nurses, Department of Health  
 Foribio Garcia, M.D., N. Laredo, Mex., Delegado Sanitario Federal  
 Helen Hackney, Providence, R. I., Teaching Health, Nickerson Settlement House  
 Lillie M. Hall, R.N., Havre, Mont., Hill County Public Health Nurse  
 Dr. Edward R. Hays, Falls City, Nebr., City Physician  
 Dr. Charles S. Holt, Fort Smith, Ark., President, Fort Smith District Health Association  
 Albini Jeannotte, M.D., Temiscaming County, Que., Medical Health Officer  
 George J. Kappler, West Palm Beach, Fla., City Bacteriologist, Department of Health  
 Florence B. Kenworthy, Dayton, O., Social Worker, Montgomery County Children's Home  
 J. C. Laney, San Antonio, Tex. (Assoc.)  
 Harvey H. Latson, M.D., Amarillo, Tex., City Health Officer  
 Henry C. Lawton, M.D., Camp Hill, Pa., Secretary, Board of Health  
 Jacob D. Leebron, Philadelphia, Pa., Assistant Immunologist, Department of Health  
 Daniel A. MacPherson, Ph.D., Chapel Hill, N. C., Professor of Bacteriology and Public Health, University of North Carolina  
 Anna H. McCarthy, R.N., Fargo, N. D., Supervisor of Nurses

Alfred R. McGonegal, Washington, D. C., Chief Plumbing Inspector  
 E. Franc Morrill, M.D., Rock Island, Ill., Director, Life Extension Department, Royal Neighbors of America  
 Ruth G. Nystrom, M.D., Minneapolis, Minn., Charge of Prenatal Clinic of Child Welfare Association  
 Bernard L. Plouffe, M.D., Webster, Mass., Chairman, Board of Health  
 Dr. E. Potvin, Chicoutimi, P. Q., Health Officer  
 Charles R. Smith, M.D., Decatur, Ill., Director of Public Health  
 Thomas B. Snoddy, M.D., White River, Ariz., U. S. Indian Field Service  
 Holman Taylor, M.D., Fort Worth, Tex., Editor, *Texas State Journal of Medicine*  
 Dr. J. H. Toussaint, Thetford Mines, P. Q., Medical Health Officer  
 Henry S. Turrill, M.D., Kent, Conn., Health Officer  
 T. H. Valentine, M.D., Lawrenceville, Va., Director, Brunswick-Greenville Health Unit  
 C. McA. Wassell, M.D., Little Rock, Ark., Director, Pulaski County Health Unit  
 L. J. Zoeller, Ivorydale, O., Industrial Personnel, Procter & Gamble Co.

#### DECEASED MEMBERS

Frederick Montizambert, M.D., Ottawa, Ont., Honorary Fellow and Past President  
 Ivan C. Weld, Washington, D. C., Elected Member 1914  
 A. C. Burnham, New York, N. Y., Elected Member 1922  
 J. A. Frank, M.D., Columbus, O., Elected Member 1927

# PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

**Chicken Pox**—Taking advantage of the control measures available only in hospitals an effort has been made to determine the approximate incubation period of chicken pox. These observations were made at the Herman Kiefer Hospital, which is the contagious disease institution of the Detroit Health Department. In a study of 67 cases it was found that most secondary cases showed eruptions from 13 to 17 days after lesions appeared in the primary case. The median in these studies seemed to be the 15th day. It was also found that infectivity during convalescence is less prolonged than commonly considered; does not necessarily coincide with the persistence of crusted lesions; and probably ceases within 10 days. It would also appear that chicken pox was not infectious 24 hours preceding the eruption.

Human convalescent serum constitutes the only medium for procuring passive immunity to infectious diseases of unknown cause. Such serum has been used extensively in this institution to prevent the spread of chicken pox imported through concurrent infections. It has been found that convalescent serum furnishes a high degree of protection if obtained from the donor within 1 month of the appearance of the eruption. Thereafter the protection is less marked, and when the period has been extended to 5 months, only one-third of the immunized susceptible patients are protected. Having taken into account a corrective factor for the normal incidence of chicken pox in any unprotected group, it has been found that the protective power of convalescent chicken pox serum varies from 91 per cent for

serum from early convalescence to 35 per cent when the serum is obtained 5 months or more after the acute attack. —J. E. Gordon and F. M. Meader, *J. A. M. A.*, 93: 2013 (Dec. 28), 1929.

**Financial Aid for County Health Work**—State aid for county health work may be used to encourage the undertaking of new activities, provide a means through which the state may discharge its responsibility to local government, and assist in relieving the relatively poor local community of its financial burden. State aid may be a specific sum based upon a standard type of organization, or the amount may vary with the size of organization and resources of the area. Another suggested method is to fix upon a subsidy based on the size of population served and quite independent of the type of organization, this in turn being increased or decreased, depending upon the resources of the local area. It is suggested that the desirable features of both methods may be had by fixing the subsidy as a certain percentage of the amount appropriated by the local area. —E. Sibley and J. W. Mountin, *Apportionment of Financial Aid for County Health Work*, *Pub. Health Rep.*, 45: 1 (Jan. 3), 1930.

**Smallpox Prevalence** — Among other matters the Permanent Committee of the International Office of Public Hygiene at its meeting held in Paris in May, 1929, considered the persistent prevalence of mild smallpox of the alastrim type in Great Britain and the United States during the past decade. The question has arisen as to whether it

would not be advisable to differentiate in administrative statistics between the mild smallpox and the classic smallpox which prevails in different countries of the Far East.

Postvaccinal encephalitis does not disappear from countries where it has made its appearance. The incidence of this complication varies greatly in the countries for which reports are available.—*Pub. Health Rep.*, 45: 18 (Jan. 3), 1930.

National Leper Home—During the fiscal year ending June 30, 1929, there were admitted to the National Lepro-

sarium at Carville, La., 49 new patients. During this same year 109,685 hospital days were furnished, 15 patients left the premises without leave, 9 of which were readmitted, and 13 died. The promising advances made in the treatment of leprosy are indicated in the fact that 19 patients were paroled as being no longer a menace to public health and 6 other patients complied with the requirements for parole but owing to inconvertible disfigurements chose to remain at the institution.—O. E. Denney, Annual Report of National Leper Home, 1928-29, *Pub. Health Rep.*, 44: 3169 (Dec. 27), 1929.

## LABORATORY

C. C. YOUNG, D. P. H.

### THE USE OF SODIUM HYPOCHLORITES TO PRESERVE MILK

WALTER S. DAVIS

*Division of Laboratories and Research,  
New York State Department of Health, Albany, N. Y.*

THE literature contains numerous reports on the use of hypochlorite solutions and chlorine as preservatives in milk which do not encourage their use because of the odors and tastes produced.<sup>1,2,3,4</sup> Nevertheless, many sanitary inspectors and others interested in safe milk supplies believe that these compounds are often successfully used for this purpose. A few tests were recently made in this laboratory on the effect of sodium hypochlorite added to milk in order that the results might be used as a basis for a definite conclusion.

Different dilutions of a proprietary preparation containing sodium hypochlorite were added to milk with an initial plate count of 120,000. Counts

were made after 2 hours at 20° C., and also for 2 hours at 20° C. followed by 16 hours at 5° C. The tastes and odors were observed and the Rupp test<sup>5</sup> for the presence of chlorine was made. The results indicate that when the solution was added to milk in a concentration of 1:5,000 of available chlorine, there was no reduction in the bacterial content in 2 hours, and, after acting for 18 hours, the original count of 120,000 was only reduced to 76,000 and the milk had an unpleasant taste and odor. In a concentration of 1:1,000 the count after 18 hours was 28,000. A chlorinous odor and taste were detected even in milk treated with a concentration of only 1:20,000 and they were very no-

ticeable in concentrations of 1:10,000. The Rupp test gave a reaction in a concentration of 1:20,000 and a strong reaction in a concentration of 1:10,000.

#### CONCLUSIONS

Preparations containing sodium hypochlorite will not materially reduce the bacterial count in milk when used in concentrations as high as 1:5,000. When used in dilutions of 1:20,000, taste and odor may be detected and are noticeable in concentrations of 1:10,000. The unpleasant taste and odor produced when sodium hypochlorite is added to milk in a sufficient

quantity to act as a preservative render its use impracticable.

#### REFERENCES

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5. Rupp, P. The Detection of Hypochlorites and Chloramins in Milk and Cream. *U. S. Agri. Bull.*, No. 1114, 1922. (Abstracted in *Exper. Sta. Rec.*, 48: 12, 1923.)

## A LOW READING TURBIDIMETER

AUGUST V. GRAF, F. A. P. H. A.

*Chief Chemical Engineer, St. Louis Water Works,  
St. Louis, Mo.*

**T**URBIDITIES of less than 5 p.p.m. are hardly noticeable when water is observed in a glass or other container and, as a result, some plants are satisfied if the effluent from their filters contains less than this amount. As far as the turbidities are concerned they are of no moment because that small amount of suspended matter is not objectionable from an esthetic viewpoint, but the plant is not producing an effluent that good design and operation warrant. Also the removal of bacteria is accomplished by the same agency that removes turbidity, although the relation is not definite because of the variation in size of both the bacteria and suspended matter.

Comparing the filter effluent with standards containing known amounts of silica is not satisfactory when low turbidities are to be determined. As a result of our desire to maintain an effluent free from turbidity, the box to be described was designed.

#### CONSTRUCTION OF BOX

The entire box, except the partition, is constructed of wood and painted black, both inside and outside. The partition of galvanized sheet metal is also painted black. All inside measurements of the box and parts should be made exactly as indicated because the dimensions locating the normal position of the light filament, the light aperture in the partition and the circular openings in the shelf are important.

The position of the light aperture and the openings are fixed but that of the light filament is adjustable. This was made so to take care of slight variations in the shape and position of the filament in the lamp. The filament may be moved closer to or farther from the partition by adjusting the metal contact in the light socket; and shifted from side to side by means of the sliding block which carries the lamp. The position of the filament from top to bottom is fixed; the open end should point



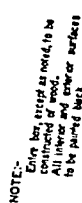


PLATE I

[illegible]

Ventilation is provided by the circular openings in the box but the lamp should be lighted only when the box is in use.

**PREPARATION OF STANDARDS**  
The tubes for making the turbidity determinations should be clear glass, 100 c.c., short form Nessler tubes, free from scratches or other imperfections. These should be scrupulously clean at all

times. Fresh standards should be prepared each day from a stock suspension, the turbidity of which should be 10 p.p.m., so that when 1 c.c. of the suspension is made up to 100 with turbidity free distilled water, a standard containing 0.1 p.p.m. will be obtained. The suspension containing 10 p.p.m. can be made from one containing enough turbidity to be determined by the Jackson candle turbidimeter and diluted to yield the desired standard stock suspension. The standards to be prepared will depend upon the turbidity of the water being tested. Experience will soon enable the observer to reduce the number of standards required to a minimum.

#### DETERMINATION OF TURBIDITY

Introduce 100 c.c. of the sample in one of the tubes and set it into one of the holes in the shelf. After all air bub-

bles have risen to the surface, the sample is ready for comparison with the standards. If the sample is filtered water of low turbidity, the standard of 0.5 p.p.m. may be prepared and set in the other hole in the shelf and after all air bubbles have disappeared, the comparison may be made. If the turbidity of the sample is less than 0.5, estimate and prepare a weaker standard; if greater, prepare a standard of greater turbidity.

The principle involved is the observation, against a dark background, of the suspended particles in the sample illuminated by admitting light rays at an angle, through the bottom of a glass tube contained in a dark chamber.

The original box was designed by August G. Nolte and the writer. The box as shown is an outgrowth of the original, changes having been suggested by other members of the laboratory staff.

## VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

#### VITAL STATISTICS FOR 1929

*New York, N. Y.*—Despite the handicap imposed by the outbreak of influenza in the early part of the year, through which the city lost about 4,000 lives above the normal, the year 1929 registered a death rate of 12.78 per 1,000 population as against a rate of 12.98 in the previous year. Infant mortality for 1929 was 59 per 1,000 live births as against 66 for 1928. All communicable diseases, typhoid, measles, scarlet fever, whooping cough, diphtheria and croup, showed substantial decreases over 1928. Increases in rates since 1928 were shown for organic heart disease, 288.1 per 100,000 as compared with 277.0; cancer, 129.4 and

128.4; influenza, 19.8 and 14.9; and diabetes, 28.4 and 27.6. Pneumonia showed a decreased rate for 1929, 156.0 compared with 166.5 for 1928; nephritis showed a rate of 52.4 for 1929 compared with 57.0 for 1928. There was an increased mortality from accidental deaths, 78.6 per 100,000 compared with 76.3 in 1928; of these, vehicular accidents showed a rate of 23.2 against 19.2 in the preceding year.—*New York City Week. Bull.*, 19: 3 (Jan. 4), 1930.

*Detroit, Mich.*—In general, the health situation during 1929 was better than in 1928. The death rate of 11.5 per 1,000 population was slightly lower than that of 1928. There were 33,500 births, representing a rate of 23.4 per 1,000

population, the same rate as in 1928. There was a gratifying decline in infant mortality, the rate dropping from 77.6 in 1928 to 69.3 in 1929, the lowest rate ever experienced in Detroit. Significant decreases were shown for tuberculosis, 94.8 to 93.0; pneumonia, 135 to 119; measles, 11.8 to 2.1; and scarlet fever, 4.7 to 3.7. The typhoid fever death rate, 0.9, was the lowest ever reported for Detroit. An increase was shown in the diphtheria death rate which rose from 16.3 in 1928 to 21.8 in 1929.—*Detroit Week. Health Rev.*, Jan. 4, 1930.

*San Diego, Calif.*—The latest U. S. Bureau of the Census population estimate for the city as of July 1, 1928, was 119,700. During 1929, the Department of Public Health registered 2,485 live births, giving a birth rate of 20.8 per 1,000 estimated population, as against 22.0 in 1928. There were 2,158 deaths registered, equivalent to a death rate of 18.0 per 1,000 population compared with 18.7 in 1928. In 1929, there were 121 deaths of infants under 1 year of age, a rate of 48.7 per 1,000 live births as against 48.0 in 1928. There were reported 1,042 personal injuries resulting from motor vehicle accidents as against 1,033 in 1928; there were 63 deaths from automobile accidents, 12 of which were children under 15 years of age. For 1929, the total death rate from automobile accidents was 52.6 per 100,000 estimated population as against 50.1 in 1928. The rates for 1929 are the highest ever attained in San Diego.—*San Diego Month. Bull.*, Dec., 1929.

*Racine, Wis.*—Present indications are that the death rate for 1929 will be 8.9, which is the same as for 1928; the birth rate will be 19.7 as compared with 19.3 in 1928; the infant death rate will be 53.1 compared with 48.7 in the preceding year. The estimated population for 1929 was 78,300. Rates per 100,000 population that decreased since

1928 were heart disease, 206 to 156; tuberculosis, all forms, 60 to 55; diseases of early infancy, 48 to 25; maternity, 16 to 10; automobile accidents, 16 to 14. Among those that increased from 1928 to 1929 were cancer, 85 to 98; apoplexy, 57 to 74; pneumonia, all forms, 69 to 84; and kidney diseases, 33 to 44. Contagious diseases as a whole decreased from 52 to 38 per 100,000 in 1929.—*Racine, Wis. Month. Bull.*, Jan., 1930.

*Syracuse, N. Y.*—The Health Department of Syracuse has reported the estimated population for 1929 as 201,645. The general death rate per 1,000 population was 13.0 as compared with 13.5 in 1928; the birth rate per 1,000 population was 21.0 in 1929 and 21.5 in 1928. The infant mortality rate declined from 58.9 per 1,000 live births in 1928 to 55.7 in 1929. Deaths from heart diseases resulted in 604 deaths in 1929 as against 598 in the preceding year. Diseases showing decreases since 1928 were cancer, 289 to 279; cerebral hemorrhage, 232 to 209; nephritis, 202 to 189; pneumonia, 267 to 266; and tuberculosis, 96 to 65. There were 5 deaths from scarlet fever as against 3 in 1928, but no other communicable disease showed an increased mortality.—*Syracuse Month. Bull.*, 5: 8 (Jan.), 1930.

*Dayton, O.*—The most important item in the health situation during 1929 was the infant death rate that fell from 66.2 per 1,000 live births in 1928 to 63 in 1929. The birth rate for 1929 was 18.4 compared with 17.7 in 1928. The general death rate for 1929 was 11.6 per 1,000 population as compared with 11.4 in 1928. Organic heart disease remains the leading cause of death, 534 deaths resulting in 1929 as against 412 in 1928. The increasing virulence of scarlet fever is indicated by 6 deaths in 1929 whereas in the 5-year period 1922-1926 the deaths only averaged 2 per year although the number of cases was

much higher. Suicides nearly doubled in 1929, the number reaching 35 as against 19 the preceding year. Other diseases showing increased deaths for 1929 were influenza, 60 as against 52 for 1928; cancer, 199 and 197; pulmonary tuberculosis, 115 and 113; and accidents, 154 and 122. Pneumonia deaths fell from 173 to 163 in 1929, and nephritis from 86 to 73.—*Dayton, Ohio, Health Bull.*, Jan. 1, 1930.

*Cattaraugus County, N. Y.*—A provisional forecast of vital statistics for 1929 indicates that the death rate will be about 13.2 as compared with 13.8 in 1928. The births are distinctly fewer than last year. The most striking figure is the infant mortality, so far 28 fewer infant deaths being reported in 1929 than in 1928, making a provisional rate of 52 for 1929 against 70 the year before. There are only 2 deaths from diarrhea and enteritis under 2 years compared with 5 in 1928. Maternal mortality, 6 per 1,000 total births, is somewhat lower than 1928. Tuberculosis deaths are only slightly above 1928, indicating a rate under 50. One death from typhoid is recorded in 1929. Other communicable disease deaths are fairly comparable with the experience of recent years. Mortality from respiratory diseases reflects the prevalence of influenza during the first 3 months of the year.—*New York Health Demonstrations*. Milbank Memorial Fund, Jan. 15, 1930.

*Illinois*—The general death rate for 1929 appears to have been on a level with that of 1928, a figure a little higher than the average for recent years. Infant mortality, on the other hand, appears to be the most favorable ever experienced by the state. Mortality from influenza was considerably higher in 1929 than the year before, most of the deaths occurring in the first 3 months. Tuberculosis was down to a new low level, with 4,845 deaths for the first 11 months against 4,974 for the corre-

sponding period of 1928. Diphtheria showed a very bad record, 8,500 cases, the highest number reported since 1923. Mortality from pneumonia behaved very much like that of influenza, case reports being under the 1928 figure by nearly 4,000. Prevalence of measles was five times greater in 1929 than in 1928. Both cases and deaths from scarlet fever were sharply above the average in recent years. The 4,227 cases of smallpox gave Illinois the worst record since 1921, and the worst record of any state for 1929.—*Illinois Health Messenger*, 2: 101 (Jan. 15), 1930.

*Ohio*—There were 3,726 more deaths in Ohio during the first 10 months of 1929 than during the corresponding period of 1928, or an increase of 12 deaths per day. Influenza showed the greatest increase in the number of deaths, 1,790, and the rate increased from 35.3 to 66.6; heart disease was second, the rate increasing from 211.2 to 217.4; whooping cough showed an increase of 320 deaths and automobile accidents 299. Other causes of death showing slight increases were: measles, scarlet fever, cerebral hemorrhage, railroad and street car accidents, suicides and homicides. Decreases were recorded in the number of deaths from diphtheria, rabies, tuberculosis all forms, cancer all forms, diarrhea and enteritis under 2 years, nephritis, and the puerperal state. For the first 10 months of 1929 there were 68,362 deaths, with a rate of 12.2 per 1,000 population compared with 64,636 for 1928, a rate of 11.6.—*Ohio Health News*, 6: 3 (Jan. 15), 1930.

**Principal Causes of Death in 1928**  
—U. S. Department of Commerce announced that 1,378,675 deaths occurred in 1928 in the registration area in continental United States, corresponding to a death rate of 12.0 per 1,000 population, as compared with 11.4 in 1927. The area for 1928 comprised 95.4 per cent of the population of United States

as against only 91.3 per cent in 1927. Increases in rates per 100,000 population for 1928 over those of the preceding year occurred from diseases of the heart, 195.7 to 207.7; cerebral hemorrhage and softening, 84.0 to 87.0; nephritis, 92.5 to 95.0; diabetes mellitus, 17.5 to 19.0; influenza, 22.6 to 45.2; and pneumonia, all forms, 80.5 to 98.0. Increases were shown also for cancer, all accidental causes, automobile accidents, measles and pellagra. Significant among decreases in rates from 1927 to 1928 were those from tuberculosis, all forms, 80.8 to 79.2 and from congenital malformations and diseases of early infancy, 67.7 to 65.6. Other causes that showed decreased death rates for 1928 were railroad and mine accidents, scarlet fever, acute poliomyelitis, typhoid and paratyphoid fever, diarrhea and enteritis under 2 years, and whooping cough.—U. S. Department of Commerce. *Press Release*, Dec. 11, 1929.

**Health of New Zealand**—The annual report for New Zealand for 1928 showed a slightly higher death rate and a falling birth rate. The death rate was 8.49 per 1,000 population, an increase of 1.7 per cent over the preceding year. Infant mortality was 36.18 per 1,000 births, against 38.74 in 1927. This phenomenally low level has never before been attained in New Zealand or in any other country in the world. The birth rate was 19.56 per 1,000, the number of births, 27,000, being much the lowest for the past 9 years.

The tuberculosis death rate was 5.02 per 10,000 population, which places New Zealand in a better position than other countries. Mortality from cancer showed an increase over 1927, the rate being 9.87 per 10,000 population. During 1928, of all persons over 40 years of age whose deaths were registered, 1 in every 7 males and 1 in every 6 females died from cancer. Scarlet fever

has been epidemic the past 2 years. For 1928, case mortality of 0.89 per cent showed an increase over the rate for 1927, 0.73. Influenza showed an increase and a higher death rate, 1.74 per 10,000, and diphtheria a slight increase, while measles and whooping cough were much less prevalent. Typhoid is still rare. There was one outbreak of dysentery.

Maternal mortality remained at practically the same level, 134 in 1928 as compared with 137 in 1927. The rate per 1,000 births increased slightly from 4.91 to 4.93 because of the lower number of births in 1928.—*J. A. M. A.*, '93: 1906 (Dec. 14), 1929.

**Respiratory Infections in Massachusetts in 1928-1929**—This is a report by the Massachusetts Department of Public Health of a survey of the epidemic of respiratory diseases made during the winter 1928-1929. The method of survey developed by the U. S. Public Health Service was used and applied to 4 widely scattered communities. The data on 10,000 persons were pooled with 5,000 obtained from Boston. These results were compared with current information obtained from various sources. Beginning the middle of December, and extending through January, daily reports from district health officers as to the number of pneumonia deaths in 6 of the principal cities were obtained. These reports represented about 1,400,000 persons or about one-third of the population of the state. In addition, weekly reports on the total numbers of respiratory disease cases were sent by 200 physicians throughout the state.

Three industries, two public utilities representing over 7,000 persons and a department store employing 4,000 persons, furnished their daily absenteeism from respiratory diseases for this year and last year. Beginning with December 22, the respiratory cases of the survey and the reports of influenza paral-

leled each other in their abrupt rise. During the critical period up to the middle of January, the doctors' replies, the data from Plant I and the department store, and the reported pneumonia cases followed each other quite closely. The cases for Plant I and the survey were similar. The situation for Plant II was more like that for the pneumonia deaths. Four large hospitals reported no increase in sickness in their staff, nor anything unusual in the number of pneumonia admissions.

The findings on the 15,000 persons in the 5 communities surveyed, showed that the highest rates of weekly increase were from December 22 to January 19, which was the peak. The increases varied from nothing to 200 per cent. In Boston, but not elsewhere, the females showed a higher morbidity rate than the males. The 0-9 age group in the total survey showed the highest rate, 34.3 per 100 population and the 20-29 and 50-59 age group the lowest, 24.2 and 25.6, respectively. Physicians were employed by all individuals with pneumonia, three-quarters of those with influenza, two-thirds of those with grippe and one-fourth of those with colds. During the 3 months studied, 2.5 per cent of the patients had more than one attack with an average interval of 32 days between. The epidemic was about half as severe as that of 1920 and one-eighth as severe as 1918. About one-quarter of the population was sick with respiratory diseases and about one-eighth was sufficiently sick to remain in bed 3 days or more.—H. Bigelow and

H. L. Lombard, *New England J. Med.*, 201: 474-478 (Sept. 5), 1929.

**Incidence of Heart Disease in the Pacific Northwest**—The data for this study were obtained from 5,489 patients presenting themselves in private practice and in 23,172 admissions to five hospitals, all from one locality in the Pacific Northwest. In this group, there were 13,258 medical patients, of whom 3,488, or 26 per cent, showed cardiovascular disease. Acute rheumatic fever showed a low incidence, 0.1 per cent as compared with 5.8 to 0.2 per cent in other localities. Goiter, being endemic, showed an incidence of 6.1 per cent of medical patients producing cardiovascular symptoms severe enough to send the patients to the hospital. Hypertensive cardiovascular disease showed a high incidence, 26.0 per cent, as in other localities. Records of 1,673 private patients with cardiovascular symptoms were studied as to etiological, structural and functional diagnoses. Hypertensive cardiovascular disease was the most frequent of all types, causing 56.3 per cent. In the goiter group, there were 144 cases, or 8.6 per cent of the total cardiovascular group, who showed various degrees of effect upon the heart. In addition to the cardiovascular group, 651 patients came for heart examinations in whom no heart disease was found. In 465 autopsies at the Good Samaritan Hospital, 96 showed cardiovascular lesions as the cause of death.—T. H. Coffen, *Am. Heart J.*, 5: 99-103 (Oct.), 1929:

# PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

**Researches on Typhoid Carriers**—The author carried out investigations to determine when the typhoid bacillus first appears in the feces of typhoid patients as well as to ascertain the time which elapsed between the cessation of acute clinical symptoms and the disappearance of the pathogenic organisms from the stools. Daily bacteriological examinations of the stools of 16 patients in the early stage of the disease showed that elimination of the typhoid bacilli through the intestine began early, in 1 case even on the 4th day. The number of bacilli so eliminated increased until the 2d week and the first days of the 3d week. Subsequently the elimination of the bacilli gradually diminished. In 2 cases, however, the typhoid bacillus was found in the excreta 5 months after clinical recovery.

The author also examined the feces of 100 typhoid convalescents and found that 67 (22.33 per cent) were carriers 1 month after clinical recovery, 26 (8.66 per cent) after 2 months recovery, 12 (4 per cent) after 3 months and only 4 (1.3 per cent) were chronic carriers. The best results were obtained with Drigalski-Conradi and Endo's media to which a little crystal violet had been added.—A. Leoni, *Bol. d. Inst. Sieroterap. Milanese*, 7: 479-495, 1928.

**An Unusual Water Works**—The Philips Glow Lamp Works requires a water supply of about 2 m.g.d. with little  $\text{CO}_2$  and iron and no manganese. The raw water, from deep wells, contains 20-25 p.p.m.  $\text{CO}_2$ ; 2-3 p.p.m. iron; and 0.3-0.4 p.p.m. manganese. This is treated in a plant consisting of jet aerators, with detention of 1 hour,

and two sand filters in series. Potassium permanganate is added between the filters. The filters are cleaned with air as well as with water. The effluent contains 2-4 p.p.m.  $\text{CO}_2$ ; 0.1 p.p.m. iron; and no manganese.—W. Rudolfs, *Water Works*, 67, 1: 7, 1928 (from Papers of Water Pollution Research Board, England).

**The Activated Carbons and Their Use in Removing Objectionable Tastes and Odors from Water**—The author considers that owing to the increase in the pollution of water supplies by industrial wastes, it is essential to find a simple and reliable method to remove tastes and odors from drinking water, and suggests the use of activated carbons. Carbon, bone charcoal and vegetable charcoal are already used extensively in filters for adsorbing coloring matter and purifying oils, sugars, etc. Activated carbon is prepared by heating carbon in closed retorts in the presence of air, steam, carbon dioxide or chloride at a temperature of about  $900^\circ \text{C}$ . Its adsorptive property is supposed to be due to the free valencies of the carbon atoms on the amorphous surface of the material. Activated carbon may be revived by heating, by heating and treating with an acid or alkali, or by passing steam through the filter, according to the material adsorbed.

After giving a brief survey of the various methods, such as superchlorination and dechlorination with sulphur dioxide, and treatment with ammonia or permanganate to remove chloro-phenol tastes from water, the author describes his experiments on removal of phenols and dechlorination with activated car-

bons. Water polluted with ammonia still wastes from a coke-oven plant was passed through a 27" filter, composed of Darco (one of the active carbons) and bone charcoal, at the rate of 2 gal. per sq. ft. per min. The amount of phenols in the polluted water was gradually increased, and chlorine was added to the filtrate. No taste was noticed until the initial amount of phenol reached 100 p.p.m., and a trace of phenol could be detected in the effluent. Similar tests made with Minchar, another activated carbon, gave tastes in the filtrate from a solution containing only 4 p.p.m. of phenols. The adsorptive capacities of Darco, Minchar and bone and wood charcoal were tested by adding 1 gm. samples to 1-litre solutions containing various quantities of phenol. The adsorptive capacity of Darco was found to be about 0.5 per cent of its weight. Darco weighs about 18 lb. per cu. ft., so that a filter bed 2 ft. deep will remove about 0.18 lb. of phenol per sq. ft. As water rarely contains more than 0.005 p.p.m. of phenol, water could be filtered at the rate of 2 gal. per sq. ft. per min. for nearly 4 years before the Darco would be so saturated with phenol that an amount sufficient to produce a taste would pass the bed.

For waters which are polluted with a variety of compounds, the addition of excess chlorine to break down the compounds, followed by dechlorination with active carbon, is probably the best method of purification. Dechlorination with active carbon has already been used by the Candy Filter Company in England for 19 years. The first dechlorinating experiment was made to dephenolate a Darco filter. After running chlorinated Chicago water through the filter at a rate of about 13.4 gal. per sq. ft. per min., the residual chlorine was removed and the carbon was re-vivified. The amount of chlorine was increased to as much as 3,000 p.p.m.

and the water filtered at the rate of about 2 gal. per sq. ft. per min. Even under these conditions the carbon was able to remove all the residual chlorine and did not appear to have lost its activity after being in contact with the strong chlorine solution.

The use of activated carbons for reducing the oxygen demand of polluted waters was also investigated and satisfactory results were obtained. As the carbon actually removes certain compounds from the water, filtration should be more efficient than the addition of one compound, such as chlorine or sulphur dioxide, which only converts offensive into inoffensive compounds. It is suggested that an effluent from a sewage disposal plant might be converted into palatable water by the processes of aeration, filtration through rapid sand filters, excess chlorination and a final filtration through a bed of activated carbon.

A short description is added of the construction of carbon filters and the best method for including them in the water works. Carbon filters should be built on the same plan as rapid sand filters, but used with an upward instead of a downward flow. It is calculated, assuming the average water consumption to be 150 gal. per head per day, that the installation of carbon filtration would raise the cost per head per year from \$1 to \$1.50, in the average city in the country.—J. R. Baylis, *J. Am. Water Works A.*, 21: 787, 1929 (from papers of Water Pollution Research Board, England).

**B. Coli Isolation on Solid Media: Relation of Direct B. Coli and B. Aerogenes Counts**—Separate *B. coli* and *B. aerogenes* estimations by direct plating methods, using cyanide-citrate-agar as a differential medium, suggested the use of such determinations in the judgment of true fecal pollution. A quantitative study of the *B. coli* and *B.*



*aerogenes* content of human and animal feces, sewage, cereals and soils gave the following ratio:

	<i>B. coli</i>	Ratio of to <i>B. aerogenes</i>
Human feces	182	" 1.0
Animal feces	145	" 1.0
Sewage (Chicago district)	1	" 1.4
Cereals	1	" 16.0
Soils	1	" 225.5

—F. O. Tonney and R. E. Noble, *Canad. Eng.*, 57, 5: 270, 1929 (from papers of Water Pollution Research Board, England).

**Increasing Capacity of a German Sludge Digestion Plant**—The efficiency of a sludge digestion tank at the Essen-Nord plant was increased 100 per cent by installing two screw pumps to agitate the sludge. The pumps lift ripe sludge from the bottom and sprinkle it on the surface. They can also be reversed to mix scum from the top with ripe sludge.—A. Kozma, *Eng. News Rec.*, 100, 9: 362, 1928 (from papers of Water Pollution Research Board, England).

**Sludge Disposal at the Calumet Sewage Treatment Works**—The Calumet sewage treatment works deal with sewage from part of south Chicago and several small municipalities. The capacity of the plant is 56 m.g.d. with an allowance for a 50 per cent storm flow increase. The sewage passes through a rack screen and grit chambers to 30 Imhoff tanks. The sewage is mainly domestic, but some trouble has been caused by paint waste. The direction of flow through the tanks is reversed at short intervals. The design of the sludge hoppers and the method of removing the sludge, which has an average content of 87.8 per cent moisture, are described. The sludge is laid on drying beds to a depth of 9–11" and after 2 months, when the moisture

content has been reduced to 39–55 per cent, hand-forked into cars running on tracks through the beds and removed to a dump.

Figures of sludge quantities and analyses are given and comparative experiments with open and glass-covered drying beds are described. A record of Imhoff tank temperatures shows that for 4 months in the year the temperature is low enough to retard digestion considerably. The digestion of Imhoff and activated sludge has been found practicable, and a method is to be adopted by which the waste activated sludge of one works will be added to the fresh sewage entering another works, and the mixed settled solids digested. A machine for removing sludge from the drying beds, developed by the Evers-Sauvage Engineering Company, is described and illustrated. A description of the gas-collecting methods adopted and figures of production are given.—A. H. Goodman and C. E. Wheeler, *Sewage Works J.*, 1: 444, 1929 (papers of Water Pollution Research Board, England).

**Report of the Investigation of the Pollution of the Mississippi River, Minneapolis to LaCrosse, Inclusive**—This investigation, made in 1928, was confined to the 60-mile section of the river from Minneapolis to LaCrosse, to determine the source, extent, and effect of the pollution, with the view of establishing such requirements as might be found necessary so that this section may no longer be detrimental to the interests affected.

The information obtained permitted the division of this part of the river into four zones:

1. From Minneapolis to Prescott, in which the water is unfit for water supply purposes, bathing, boating, and livestock. In this area nuisances are frequent and fish life practically absent.

2. From Prescott to the head of Lake Pepin,

in which zone some improvement is shown, but the river is unfit for use as a water supply source, or for bathing, and is even dangerous to the health of those coming in contact with it.

3. A zone through Lake Pepin where the water does not comply with standards set for bathing, but in which at certain points the coli-aerogenes content is reduced to where it meets the standards for permissible loading of purification plants.

4. A zone below Lake Pepin where the water appears to have recovered from the effects of the pollution introduced above the lake.

The opinion of the investigating authorities is that the pollution of the river should be restricted so that "the public health hazard will be reduced to a minimum, the live stock will not be materially endangered, the present public nuisance will be eliminated and the fish life in the river, at least below the mouth of the St. Croix, not be jeopardized."

**Lead Poisoning from Lead-Piped Water Supplies**—Investigations in the industrial clinic of the Massachusetts General Hospital led to the conclusion that non-industrial lead poisoning was a public health problem of importance in districts using lead pipes, especially where soft water was supplied. Investigations showed that the lead content of waters bore a striking relationship to the carbon dioxide content, and that there was little connection between length of pipe and lead content. Figures are given of the incidence of poisoning at different ages and under different conditions.—W. Wright and C. O. Sappington and E. Rantoul, *J. Indust. Hyg.*, 10: 234, 1928 (papers of Water Pollution Research Board, England).

**Sewage Treatment in Wisconsin**—Public interest in the treatment and disposal of sewage has been steadily developing in Wisconsin, and the Committee on Water Pollution was created in 1927. The state of sewage treatment is graphically presented in a map,

and is shown in a table of the systems adopted. Approximately 55 per cent of the population is served by some form of sewage treatment. The activated sludge plant at Milwaukee serves also 8 surrounding towns and villages. The majority of plants consist only of some form of tank treatment, but recent designs tend toward separate sludge digestion followed by trickling or sand filters. At Hartford and Kiel, Dorr clarifiers and thickeners are used, and at New Holstein a Dorr clarifier with lime precipitation has proved reasonably successful in dealing with pea canneries wastes. Other plants of special interest are referred to. Supervisory, operating and financial difficulties are discussed, and a sewer rental law enacted as a result of the experiences of Ohio and Michigan is quoted. A program of plant inspection and studies to be carried out in coöperation with operators and municipal officials has been adopted by the State Board of Health.—L. F. Warrick, *Sewage Works J.*, 1: 481, 1929 (papers of Water Pollution Research Board, England).

**Oil Mixtures and Oil Equipment for Anopheline Larvae Control of Impounded Areas**—An impounded area of 7,000 acres in Georgia was controlled by oiling with high pressure spray nozzles operated from boats equipped with outboard motors. Different mixtures of fuel oil and kerosene were first used with poor results. Excellent results were finally obtained by the use of a mixture of 20 per cent black oil (for maintaining the film), 20 per cent kerosene (for toxic effect), and 60 per cent paraffin oil (for spreading). With oil at 11 cents per gallon, the total cost of 22 applications for the season was \$35.00 per acre or \$63.34 per mile of shore line. A list of equipment and detailed costs are presented.—L. M. Clarkson, *South. M. J.*, 22, 4: 397–398 (Apr.), 1929. Abstr. A. W. Fuchs.

# INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

**Sickness among Industrial Employees**—From the summary: 1. Reports from a group of about 35 industrial sick-benefit associations and company relief departments showed that cases of sickness and nonindustrial injuries causing disability for 8 consecutive calendar days or longer occurred at the rate of 103.5 cases annually per 1,000 men during the period 1921 to 1928, inclusive. The rate is considered conservative for various reasons explained in the context.

2. Respiratory diseases were reported as the cause of 42.4 per cent of the cases; digestive diseases, 13.5 per cent; and external causes (nonindustrial accidents), 9.8 per cent. These three groups, accordingly, accounted for nearly 66 per cent of the cases for which sick benefits were paid by associations reporting to the U. S. Public Health Service.

3. In the respiratory group influenza or gripe continues to be of outstanding importance, accounting for 57.5 per cent of the respiratory cases in 1928, compared with 50 per cent during the period 1921 to 1928.

4. The frequency of disability on account of respiratory tuberculosis was lower in 1928 than in any of the preceding years of record.

5. Five of the 9 years covered by the record were marked by influenza epidemics. In the other 4 years the winter incidence of influenza or gripe was of no inconsiderable magnitude.

6. Relatively low sickness rates were found among men employed in the iron and steel industry. An exception was the rate for pneumonia, which appears to be about 50 per cent higher than

among other industrial employees as a whole. Data for a study of the incidence of pneumonia by occupation in the steel industry have been collected and are being analyzed.—Dean K. Brundage, *Pub. Health Rep.*, 45, 3: 107-116 (Jan. 17), 1930.

**Physiological Factors of Mine Ventilation**—This circular is a very comprehensive summary of recent investigations on silicosis in Australia, Canada, England, Finland, France, Germany, Poland, Scotland, South Africa and the United States. Likewise, a summary is given of recent investigations on abnormal air conditions in mines in relation to high temperatures and humidities and gases found in mines in the various countries named.—R. R. Sayers, *Circular 6196*, U. S. Bur. Mines, Nov., 1929, 17 pp.

**Industrial Gas Masks Abroad**—This circular discusses the construction of gas masks in general, including the American all-service type with a full-page diagram, and the gas masks used in England, Germany, France and Belgium. The discussion concerns particularly protection from carbon monoxide and also masks used for other poisonous gases, with some details of foreign regulations concerning their use. There are 19 accompanying references.—S. H. Katz, *Circular 6206*, U. S. Bur. Mines, Dec., 1929, 13 pp.

**Occupational Diseases, Connecticut**—During the month of November, 1929, there were reported 1 case of benzol poisoning, 8 of lead poisoning, 2 of pneumokoniosis, and 17 of dermatitis

and eczema due to the following causes: accelerators, 2; chemical, 1; mercury compound, 12; plating solution, 1; and wood, 1.—*Connecticut Health Bull.*, Dec., 1929, p. 446.

**Occupational Diseases Investigated in Massachusetts in 1928**—Of the 292 cases of occupational diseases investigated 32 occurred among women. There was one fatality each due to lead poisoning, benzol poisoning, carbon monoxide gas, and one with the cause unstated. Of the total, 123 were due to industrial dermatitis, 41 to lead poisoning, 30 to gas poisoning, 22 to acid and oil fumes, 21 to chrome poisoning, 12 to eczema, 5 to cyanide poisoning, 4 to benzol poisoning, 7 to anthrax infection, 4 to dust inhalation, 1 to tuberculosis, and 16 to other causes.

The industries in which the diseases occurred were as follows: tanneries, 60 cases; textile, 48; mechanical, 38; rubber mills, 24; foundry, 19; metal trades, 13; shoe manufacturing, 10; chemical manufacturing, 9; printing, 5; wood-working establishments, 2; paper mills, 1; mercantile, 1; and miscellaneous, 62.

Investigation of the causes showed in numerous instances that working conditions and equipment were at fault; although the report states that proper measures had been taken for the protection of workers using benzol in different processes in 4 factories, 1 case of poisoning had occurred in each factory. The fatal case occurred in an asbestos textile plant.

Defective or inadequate equipment was found, or employees were not properly safeguarded in other ways even in factories where it was reported that proper measures had been taken for their protection.—Massachusetts Department of Labor and Industry, Division of Industrial Safety, *Report for the year ended Nov. 30, 1928*, pp. 22-31 (abstract from the *Month. Labor Rev.*, 29, 6: 64-66 (Dec.), 1929).

**Industrial Partnership**—"Industrial Partnership," as designating the modern relationship between employers and employees, is becoming a real working philosophy. This philosophy is a philosophy of management in which the keynote is coöperation, pulling together instead of acting at cross purposes. Good industrial relations have proved to be good business. While it is difficult to find any statistical gauge with which to measure the value of good industrial relations, it is strikingly reflected in the tremendous decline in industrial disputes during recent years. Industrial disputes recorded by the U. S. Department of Labor declined from 3,789 in 1916, to 571 in 1928, or, expressed differently, for every 100 disputes which occurred in 1916 there were only 15 in 1928. This indeed is a significant and encouraging phenomenon to those concerned in furthering the spirit of coöperation between employer and employees and turning what used to be called "the labor problem" into real "industrial partnership."—Brown, Chamber of Commerce of the Borough of Queens, Long Island City, N. Y., NR. No. 255, QCC, 1929.

**Conditions of Work in Spin Rooms**—A study has been made of the effect of a change of method in the spin room on absence and turnover among women operators in 4 mills from which, however, the results are inconclusive. Another study was made on temperature readings in 15 mills in which it was found that for *dry-bulb* readings, 55 per cent were between 75° and 85° F., with the remainder above 85° five times as often as below 75° and with these high temperatures tending to be emphasized in the northern mills as compared to southern mills. Furthermore, there was a distinct tendency to sustained temperatures of 80° and over without variations of more than 3°, these conditions more noticeable in southern mills. *Wet-*

*bulb* readings were largely between 70° and 75° F., with southern mills tending to exceed this. Sustained temperatures and lack of variation were both more pronounced in southern mills. As to *relative humidity*, one-fourth of the records were 60 and under 70 (%) in 18.2 per cent of the northern mills and in 33½ per cent of the southern mills, this being within this desirable range; one-fifth of the temperature readings had a relative humidity of 70 (%) or over.—Ethel L. Best, U. S. Women's Bureau, *Bull.* 72, 1929, 41 pp. (tables).

**Silicosis Prevention in South African Gold Mines**—In the course of the meetings of the British Association in Johannesburg, Professor J. S. Haldane read a paper on July 31, 1929, on the avoidance of silicosis with dry methods of working. Preventive measures underground have consisted largely in laying the dust by wet methods, resulting in a virtually saturated atmosphere which, because of its depth of 7,000 ft. and lower, is also of high temperature, thus rendering muscular effort impossible without grave danger. It was the solution of this problem which was primarily in mind.

Haldane's animal experiments suggested that quartz in shale dust with 60 per cent of total silica did not produce phthisis. "Shafts, inclines, and open levels should be kept dry and stone-dusted with the added dust." Drills should be provided with dust collecting arrangements. Blasting should be so arranged that the dust is scattered over surrounding surfaces with each shot.

Dr. A. J. Orenstein pointed out that the majority of cases of heat strokes occurred among new workers, showing that acclimatization was an important factor, so that it is the practice to put new workers in relatively cool places for a week or two.

Dr. H. Pirow, government mining en-

gineer, sounded a note of warning that the suggestion to use the dangerous silica dust by dry methods might be wrongly interpreted, and the practicability should be investigated before the use of water is restricted.—*Industrial and Labour Information*, 32, 6: 242-243 (Nov. 11), 1929.

**The Doctor Looks at Child Labor**—The effects on health of child labor are reviewed by 15 specialists, each stating his views according to his specialty, as follows:

*Chronic Fatigue*, Charles Hendee Smith, M.D.

*Hidden Infections*, Eugene L. Opie, M.D.

*Physical Unfitness*, William R. P. Emerson, M.D.

*Years of Growth*, Haven Emerson, M.D.

*Poison Trades*, Alice Hamilton, M.D.

*Cardiacs without Symptoms*, Joseph H. Bainton, M.D.

*Colts in Harness*, Iago Galdston, M.D.

*Monotony Exact's Price*, Louis I. Harris, M.D.

*Papers! All the Evenin' Papers!* Max Seham, M.D.

*Young Nomads*, Richard A. Bolt, M.D.

*When the Hand Slips*, Catherine Brannick, M.D.

*When Working Conditions are Bad*, George M. Kober, M.D.

*Undernourished Minds*, C. Floyd Haviland, M.D.

—The National Child Labor Association, 215 Fourth Avenue, New York, N. Y., *Publication No.* 356, 1929, 22 pp., ill. Price, 25 cents.

**The Dangers of Carbon Monoxide Poisoning and Measures to Lessen These Dangers**—This is Report No. 1 of the Committee on Poisonous Gases of the American Medical Association, drafted for the committee by Dr. Yandell Henderson. The other members of the committee are Dr. H. Gideon Wells, Chairman, Dr. Paul Nicholas Leech, Dr. Carey P. McCord, and Dr. L. R. Thompson.

The article reviews the conditions

producing carbon monoxide, asphyxiation by city gas, exhaust gas from automobiles, pollution of air in streets, poisonous action of carbon monoxide, gas masks, resuscitation and inhalational treatment. [The article should be seen in the original by all who are interested. The abstractor's only comments consist in emphasizing the dangers of defective burners on domestic gas fired heating appliances which may in themselves transform a gas containing no carbon monoxide, like natural gas, into one rich in carbon monoxide if the air supply is not properly adjusted to the gas pressure, and to issue a word of warning in testing the quality of an atmosphere by the use of canaries. Some personal experience with canaries in which they were allowed to become gradually acclimatized to an atmosphere which, within 8 hours' time, gradually accumulated carbon monoxide gas from 0 to over 0.5 per cent, failed to more than increase the breathing rate and ruffle the feathers on two canaries so exposed, while 2 white rats were in stupor under the same circumstances. Guinea pigs, however, were not noticeably affected. Undoubtedly, the situation would be entirely different where the canaries are rather rapidly exposed to concentrations of carbon monoxide much lower even than 1 per cent. None of the animals used in the above experiment had had any previous exposure to the gas.]—*J. A. M. A.*, 94, 3: 179-185 (Jan. 18), 1930.

**Carbon Monoxide Poisoning in an Automobile**—Two strong healthy men were found dead and the driver in a helpless condition in a closed automobile, and the evidence showed that the men had drunk a pint or two of beer, from which the driver was charged with drunkenness while in charge of the car.

Fortunately for the driver, J. S. Hal-dane and Leonard Hill read the report

of the inquest and, seeing that a miscarriage of justice was likely to arise, attended the trial and from evidences which pointed to the peculiar pinkness of the blood bore out the opinion of another physician that death was due to carbon monoxide poisoning.

Hill points out that Dr. Argyll Campbell has found that the injection of alcohol into the veins of rabbits lowers the oxygen tension in the tissue spaces by one-third. The evidence was that while the men had taken a couple of pints of beer, they were sober just before they drove into some water on the road where the car was found. The water was high enough to wet their feet and also to cover the exhaust pipe, so that the fumes escaped into the car. With the engine racing Hill estimated that there may have been 15 per cent of carbon monoxide in the fumes.

The evidence of the police shows that knowledge of the danger of the exhaust fumes of cars and of the fact that poisoning by these produces the same effect as alcohol has not been spread widely enough.—*J. A. M. A.* (London Letter), 94, 2: 116-117 (Jan. 11), 1930.

**Benzol Poisoning and Its Prevention in the Rubber Industry**—The classifications of the various commercial grades of benzol and a review of its use in the rubber industry are briefly stated. Of the three possible avenues of entrance of benzol into the body—respiratory, alimentary, and skin—only the respiratory is considered of any significance, so far as this industry is concerned. The human system can tolerate very minute amounts over a period of many months if proper aeration and elimination are instituted. Thus an equilibrium may be established between intake and output to this extent.

The chief symptoms of sub-acute and chronic cases and the blood disturbances are briefly listed. "The effects

of benzol are accumulative, more lasting and more severe than those of gasoline." Complete recovery follows exposure to temporary slight concentrations, but it is the constant absorption of small amounts daily that produces the detrimental effects.

The preventive measures comprise: (1) Ventilation and safety devices; (2) the placing of only healthy individuals on operations using either benzol or gasoline; (3) an education program; (4) frequent examinations, especially of the blood; and (5) substitution products for benzol such as high test gasoline, etc. The author's experience has shown that undernourished, anemic individuals, those afflicted with bronchitis, any pulmonary conditions, cardiac or kidney infections should not be employed with either benzol or gasoline fumes present. Likewise, females should not be so employed.

Certain individuals tolerate a large amount of benzol and show very little physical effect. Shallow breathers seem to be less affected. "Alcoholics seem to tolerate benzol or gasoline fumes to a greater extent than others." In benzol exposures workers should be examined every 30 to 90 days (blood, blood pressure, urine, vision, sensory and equilibrium). Where examination shows any indications of absorption the individual is transferred (The Goodyear Tire & Rubber Company).

When admixtures contain carbon tetrachloride to reduce the fire hazard, they should be used only in closed systems of ventilation, due to the extreme nausea and severe vomiting occasioned by the latter substance. "Gasoline works almost as well as benzene in most operations." "It requires very close coöperation between the medical department, the chemical department, safety department and production efficiency department to arrive at a proper conclusion" regarding the use of a substitute product in industry.

Methods of correcting conditions, treatment of the individuals, and a discussion complete the article.—Paul A. Davis, *Ohio State Med. J.*, XXV, 10: 798-801 (Oct.), 1929.

**Gas Poisoning—Blood Transfusion**—Three telegraph workers were victims of severe carbon monoxide poisoning. Two recovered after blood-letting, lobelin, camphor and inhalation of a combination of oxygen and carbon dioxide gas. The third remained unconscious and his condition got worse and worse; whenever the irritation through the inhalation of the carbon dioxide was discontinued, he ceased to breathe. A transfusion of 400 c.c. of blood resulted in an immediate improvement. Consciousness returned and he recovered completely. "The red blood corpuscles which are introduced evidently assume their function of binding oxygen at once."—Dr. V. Voithenberg, Heidelberg. Abstracted by *Ars Medici* (Oct., 1929, 445) from *Deutsche med. Wchnschr.*, No. 20, 1929.

[The above item should be compared with the following statement taken from *Report No. 1* of the Committee on Poisonous Gases of the American Medical Association, 94, 3: 183 (Jan. 18), 1930, which reads as follows:

Transfusion of blood in cases of carbon monoxide asphyxia, although not harmful, is certainly quite useless. It is performed only when the patient is still unconscious several hours after the asphyxiation. Most of the carbon monoxide, even in a patient not treated by inhalation, has by that time been eliminated from the blood. The continued coma is due to edema of the brain and other post-asphyxial injuries to the nervous system which transfusion of blood does not benefit.]

**Chronic Benzene Poisoning Improved by Liver**—A Greek-American laborer, aged 38, was admitted to the hospital, November 16, 1928, because of severe bleeding from the gums of 3 weeks' duration, with frequent nose bleed, and spontaneously appearing

black and blue spots on the skin for 2 weeks. During the previous August, he had begun work in an artificial leather shop. Shortly after beginning this work he lost his appetite, felt nauseated at times, and vomited about once a week. At the end of 3 months he noticed itching of the skin and his gums began to bleed. A physician had attempted by various ordinary means (described) to stop the bleeding which followed the removal of two teeth by a dentist, but to no avail. The diagnosis on entering the hospital was puerpera hemorrhagica. On admission the temperature was 101.2° F.; the pulse rate, 96; respiration 24, and the blood pressure was 125 systolic and 80 diastolic. The patient was well developed. There was a vile odor from the mouth. The blood count was as follows: hemoglobin, 62 per cent; red blood cells, 3,300,000; leukocytes, 1,350; polys, 25 per cent;

lymphocytes, 75 per cent; and platelets, 25,000. The bleeding time was 33 minutes.

Three blood transfusions were made at intervals of a few days up to the 10th day, but the blood did not show any improvement. On November 30, 3 days after the third transfusion, half a pound of liver was daily included in the diet. The white count began to show a slight increase on the 3d day, and by the 8th day was 3,900, while bleeding from the gums diminished and was practically absent after December 9. Liver therapy was continued for 7 weeks and the patient kept under observation for 3 weeks longer. In July, 1929, he presented a normal blood picture with the exception of a slight leukopenia of 4,700. He did not resume the liver diet.—Adelaide Ross Smith, *J.A.M.A.*, 93, 25: 1970 (Dec. 21), 1929.

## FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

**The Distribution of Vitamin A in Some Corn-milling Products**—This is a qualitative and quantitative study of the distribution of vitamin A in yellow corn in view of the somewhat discordant reports as to the potency of yellow corn in this vitamin. The milling products obtained in the wet-milling process of cornstarch manufacture include starch, corn-germ, corn-germ meal, crude corn oil, grits, gluten, dried steep water, bran (reel slop) and gluten feed. Young rats, 28 to 30 days old, were brought to the condition of ophthalmia by an appropriate vitamin A deficient diet. The food was irradiated and the vitamin B factors were supplied by dried brewers' yeast. The standard rate of

growth for recovery was determined by feeding 8 drops of cod liver oil daily after ophthalmia appeared. Eye symptoms usually developed in 25 to 35 days after the start of the basal diet when various test feeds were added, supplementing the same percentage of starch, or Crisco, or both in the basal diet. Vitamin A value was judged by the minimum dose necessary for the cure of the eyes. Similar amounts, 1.5 gm. daily, of the milling products were fed except in the case of steep water, reel slop and grits, which replaced 50 per cent of the diet. In spite of the comparative high levels of these 3 no reduction in the extent of ophthalmia was observed. Gluten feed in the 1.5 gm.



daily amounts rapidly cured ophthalmia. This is composed of reel slop, grits, steep water and gluten, which indicate all the vitamin A is in the gluten. Since about 10 per cent of the corn is returned as gluten, comparable results should obtain with feeding 0.1 gm. gluten and 1 gm. whole corn; the latter cured ophthalmia but the 0.1 gm. gluten was not sufficient, indicating some loss of vitamin A in the separation. Corn oil, 1.5 to 1.7 gm., slowly cured ophthalmia but the germs and the germ meal even at higher levels were ineffectual. Refined corn oil was found to be deficient in vitamin A owing probably to the result of heating in purification. These experiments show high calcification of vitamin A to be associated with the high pigmentation in corn. The concentration is greatest in the nitrogenous outer layer of the endosperm.—Clara Rocke Meyer and Rossleene Arnold Hetler, *J. Agri. Res.*, 39: 767 (Nov.), 1929.

**The Vitamin C Content of Fresh Sauerkraut and Sauerkraut Juice**—In spite of a popular belief that sauerkraut is antiscorbutic, two experiments as a result of review of the literature indicate the contrary when sauerkraut is fed at 2.5 and 5 gm. levels to guinea pigs. Two antiscorbutic rations were tried, one, chiefly soy bean flour, and the second, alfalfa, and after demonstrating comparable results the second ration was used throughout the experiment. The protective method was used with young guinea pigs.

The sauerkraut was made from cabbage cut the first week in November, mixed with salt, and allowed to ferment for 90 days at 60 to 65° F. The top sauerkraut was removed and the remainder found of good quality with an acidity of 1.7 per cent as lactic acid. The juice was obtained by pressure from the kraut. In order to induce

better consumption the acidity was half neutralized with normal NaOH. Three levels, 10, 5 and 2.5 gm. sauerkraut, daily were fed. Graphs indicate that the 10-gm. level offered complete protection from scurvy, and there were good gains in weight. This amount appeared to be equivalent in vitamin C to 5 gm. raw stored cabbage. There was no evidence of scurvy in the pigs fed on the 5-gm. level but the average gain is slightly lower than with the higher amount. Out of 6 animals on the 2.5-gm. level daily, only 3 lived through the period. On autopsy there was slight indication of scurvy. The maintenance level of sauerkraut is considered to be 2.5 gm. If 1 gm. raw cabbage is the minimum protective dose this will indicate about one-half vitamin C content destroyed in making sauerkraut. The discordant result of previous investigators whose sauerkraut was obtained from grocery stores is predicated on the possibility of loss of vitamin C by exposure to air in repacking and retailing. Oxidation and not fermentation is the responsible factor. The authors point out that the presence of vitamin C in this experiment will not warrant the assumption that commercial sauerkraut is potent as it reaches the consumer.—Bertha Clow, Abby L. Marlatt, W. H. Peterson and E. A. Martin, *J. Agri. Res.*, 39: 963 (Dec.), 1929.

**The Vitamin A Content of Yellow and White-Capped Yellow Dent Corn**—Experiments recorded in the literature as well as practical feeding trials have shown the superiority of yellow corn in vitamin A over the white variety. This work was undertaken to determine quantitatively vitamin A in white-capped yellow dent corn. Young rats, 35 to 55 gm. weight, were placed on a vitamin A free diet, modified to include vitamin C, vitamin B complex and vitamin D (through irradiated

cholesterol). In about 5 to 6 weeks the animals were depleted of vitamin A and ophthalmia was in evidence. The corn was ground fine and fed daily except Sunday. Preliminary trials indicated 500 mg. yellow corn per day, and 750 mg. of white-capped corn would result in average gain of 3 gm. per week for 8 weeks. The average net gains for the period were 34 gm. for the white-capped variety and 40 gm. for the yellow variety. The difference between the two means, 6, is less than twice the probable error. This difference is not regarded as significant and the yellow variety is judged to be 50 per cent more potent in vitamin A than the white-capped. The pigmentation of the white-capped variety is less than the yellow but greater than the nonpigmented white variety which has been found very deficient in vitamin A by other workers.—Walter C. Russel, *J. Nutrition*, 2: 265 (Jan.), 1930.

**Effect of Liver Diet on Healthy Organism**—Neidhardt and Bannasch administered 500 gm. of raw or fried liver daily to eight healthy young men for a period of from 12 to 32 days. At the same time the ingestion of fats was limited and foods rich in vitamins were administered. The ingestion of substances that injure the liver, particularly alcohol, was forbidden and the men were made to lead a regular life and to avoid strenuous bodily exertion. Before the liver diet was begun they were examined clinically and hematologically. The authors noted that even in healthy per-

sons the ingestion of liver produces a definite increase in the number of erythrocytes and a definite but less marked increase in the hemoglobin content of the blood.—*Ztschr. f. klin. Med.*, 111: 147-302 (Sept. 12), 1929. Abstr., *J. A. M. A.*, 94: 71 (Jan. 4), 1930.

**Vitamin D Content of the Fat of Marine Mammals**—Studies were carried out on rats with the subcutaneous fat of the seal and the dolphin. The seals were obtained from the Caspian Sea and the dolphins from the Black Sea. All of the rats were kept during the experiment in diffused daylight or semi-darkness. After a preexperimental period in which the vitamin D reserves in both the lactating mothers and the young rats were somewhat depleted, a definite rachitic diet was begun and both the prophylactic and curative determinations were made. Experiments indicate that the subcutaneous fat of these animals contains significant amounts of vitamin D, both the curative and prophylactic effects of experimental rickets obtaining with a dose of 0.15 gm. per day, which is equivalent in the case of the seal to 1.4 to 2.1 per cent, and in the case of the dolphin to 1.5 to 2.9 per cent of the food consumed. This compares favorably with the results reported by McCollum and co-workers for good cod liver oil which would demonstrate clearly an anti-rachitic effect in 5 days when in proportion of 1 per cent of the diet.—S. N. Matzko, *Biochem. Ztschr.*, 213, 4-6: 391 (Oct. 8), 1929.

# PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.\*

**The High Cost of Nursing**—In the January *Survey Graphic* which is entirely given over to a discussion of adequate medical care for every man, Janet Geister, R.N., director of the American Nurses' Association, has contributed an article which explains how nurses can adapt their services to middle class needs and purses.

The tradition of providing continuous nursing service to every patient, with a nurse at the bedside 24 hours a day, was established more than half a century ago. Then, with muddy roads and no telephones, doctors were more inaccessible. The physician today has changed from saddlebags to a well-equipped office, but the old practice of continuous nursing still persists. To the average householder, "calling in a nurse" means bringing in the private duty nurse at what he considers an exorbitant cost. And yet the average yearly salary of the private duty nurse is \$1,400.

Every year our visiting nurse associations, which provide bedside nursing to the sick in their homes on a visit basis under the supervision of the family physician, report an increase in their work. The majority of the sick in their homes today do not need continuous nursing care and would suffer no danger under intermittent or hourly nursing. It means waste and cost to nurse the majority of sick patients in their homes on the continuous bedside nursing basis, because the patient pays the private duty nurse for her idle hours with him

as well as for her busy ones, and he cannot pay more than he is now paying. On the other hand, it is the nurse who pays for the time she waits between calls, and she cannot charge the patient less than she is charging.

The problem today is to make it possible for the patient to pay less for skilled nursing care and for the nurse to have a larger and more regular income. If the patient, physician and nurse join hands, why not a broad extension of the principles and methods of visiting nursing? And this means organizing graduate nurse staffs on a salary basis under a bureau or association. The visiting nurse association has already demonstrated how to maintain a high standard of work while distributing nursing service effectively and economically.

Most hourly nursing offered on an organized basis is done by visiting nurse associations or insurance companies. It is done on an appointment basis, and a higher charge is made than for other visiting nursing calls.

To quote from Miss Geister's article:

I believe that the broad extension of the intermittent or hourly nursing principle, designed primarily to bring adequate skilled service to the patient in modest circumstances, is essential if we are to reduce the cost of nursing and at the same time not lower its quality. This extension, however, depends on two major factors: the reëducation of community, doctor and nurse in the use of nursing service; and the development of organized facilities for meeting all types of nursing needs. . . .

Has not the community some responsibility for promoting experiments that will tend to solve one of the cost features in its sickness problem? Can it not discharge this responsibility most effectively at this stage by provid-

\* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

ing the capital necessary to finance projects in intermittent nursing until they become self-supporting?—

Janet Geister, R.N., *The High Cost of Nursing*, *Survey Graphic*, Jan., 1930, pp. 426-428.

**Industrial Nursing Project**—At the fall meeting of the Executive Committee, the director of the National Organization for Public Health Nursing reported on the new industrial nursing project being undertaken with the co-operation of the National Tuberculosis Association.

In the scope of this project the following problems will be included:

1. Preparation of the industrial nurse
2. Content and procedure in an industrial nursing program, with special reference to its relation to the whole industrial health program and industrial management
3. Possibilities of industrial nursing for small plants
4. Relationship of industrial nursing to various phases of the community health program—particularly to the public health nursing organizations

Violet H. Hodgson, an assistant director of the National Organization for Public Health Nursing, is devoting a large part of her time to making contacts in the field with industrial management and industrial nurses in studying this question.

The following have been appointed to compose a special advisory committee for the project: C. O. Sappington, M.D., National Safety Council, Chicago; Alice Hamilton, M.D., Harvard University, Boston; Mary Elderkin, Union Carbide Company, New York,

N. Y.; Eleanor Little, United States Rubber Company, New Haven, Conn.; Elizabeth Fox, R.N., American Red Cross, Washington, D. C.; Volney S. Cheney, M.D., American Association of Industrial Physicians and Surgeons, Chicago; Julia A. Weder, Giant Portland Cement Company, Egypt, Pennsylvania; and Ruth C. Waterbury of the Industrial Nursing Section, National Organization for Public Health Nursing, New York. Kendall Emerson, M.D., of the National Tuberculosis Association, New York, with other representatives of that association, will also sit in on the committee.—Katherine Tucker, Fall Meeting of the National Organization for Public Health Nursing Executive Committee, *Pub. Health Nurse*, XXI, 12: 646 (Dec.), 1929.

### Mexico Is Using Visiting Nurses

—The Federal Department of Health of Mexico has just decided to undertake an educational campaign to teach child hygiene in the poorer homes by means of visiting nurses. A nurse will remain in each home one or two days or longer if necessary. She will give the mother theoretical and practical instruction in child care, home management, dietetics, and cooking; she will also teach personal hygiene to other members of the family. Follow-up visits will be made regularly to see whether the nurse's instructions are carried out. The corps of nurses necessary for this work is already available, and the work will be started very soon.—*El Universal*, Mexico City, Oct. 15, 1929. I. H.

# EDUCATION AND PUBLICITY

EVART G. ROUTZAHN\*

**Slogans in All Languages**—Can you get your slogan translated into all the languages spoken in your community, or your state?

You might make the translation job into a contest, giving awards for the most accurate and carefully written translations. Before the awards are announced you might give out the list of languages already represented, asking for other languages actually spoken in your community, or simply invite additions whether or not they are in use in your territory.

**How a President Gained and Lost Health**—In "Admiral Grayson Lifts the Veil," we are told that

Mr. Wilson was never strong physically. From early youth he had to fight a constant battle for health. The fierceness of this battle was greatly increased by the mental and physical strain under which a President labors. Ever urged on by a sense of public duty, he realized that he must keep physically fit, so that he could carry the burden placed upon him as President. Consequently, he was the best patient a doctor ever had. He carried out my instructions to the letter.

Much against his natural inclination, he regularly took the physical exercise prescribed. He rigorously followed a diet, except in rare instances, when it was necessary for social reasons to depart from it. He slept and worked the number of hours ordered. In fact, his whole life was ordered according to schedule. Under this strict regimen he enjoyed almost perfect health.

Just prior to America's entrance into the war, he said to me: "I am in better health than I have been in forty years." He looked younger and better. His weight increased to 179 pounds. . . . Then came the World War with its added burdens, which was climaxed

by the Peace Conference. When he arrived in Paris, his whole system of living, which we had so carefully built up, had to be changed. He had no time for golf, no time for rest, no time for recreation and exercise, and it was impossible to carry out in hospitable France the rigid diet which he had followed in his own country.

Then is pictured the conditions of life leading to the tragic breakdown. Can health workers use this material?—In *The Home* (Woolworth stores), Jan., 1930.

**Free But Not for Free Distribution**—A first aim of this department is to make it easy for health workers to get samples of interesting health education materials. And many health agencies are ready to play the game by supplying samples free or for a few cents for postage.

*Free* after mention of any material means that a sample is free. Very seldom are free copies available in quantities for distribution by other agencies. Why should free copies be supplied? Not even the national agencies have funds for that purpose.

One state department writes:

We are always glad to send sample copies to health workers throughout the country, but frequently are asked to send sufficient numbers for classes which, of course, we cannot do.

Our leading writers of books on health education in schools do much to complicate matters for those who are not prepared to supply free material for the schools. The most widely distributed manual on health education gives dozens of addresses with no clear statement as to what teachers may expect to receive in answer to their requests. Two of the most significant books on health educa-

\* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

tion written by two of our most distinguished and helpful writers confuse matters for teachers who seek helps for classroom work by the nature of the reference lists in those books. Thousands of letters of explanation must be written because three writers of text books were not careful and clear in suggesting sources of information.

**Health Was First**—The program of the Health Division, National Conference of Social Work, for the meeting in Boston, June 9-14, was the first of the 12 division programs to be complete as to topic and speakers. Congratulations to Chairman Ira V. Hiscock of New Haven, Hawaii and elsewhere.

**How Is Your Town?**—This question is asked by the American Social Hygiene Association, 370 Seventh Ave., New York, N. Y.

Does your community have laws and ordinances for the prevention of charlatany? Is there a "men's specialist" or a showily advertised "medical institute for blood diseases"? Do posters appear in public places advertising medicines for self-treatment? Does your local paper carry advertisements of the type mentioned? Does your neighborhood drug-store do a thriving business in nostrums?

The association will greatly appreciate any information you may wish to send us on these questions.

A review of "The Charlatan and Venereal Diseases" contains useful background data for anti-quack campaigning. In *Social Hygiene News*, American Social Hygiene Association. Nov. 15, 1929. *Free*.

A reminder of conditions which exist in other cities is "The Exploitation of Poverty, Lowest of All the Rackets." *New York World*. Nov. 29, 1929. Tells of the "Blood Donor," the "Health Inspector," etc.

**Statistics of Interest to Newspaper Readers**—The following from the Illinois Department of Public

Health might be duplicated with the figures for other states:

Springfield, November 27: Every person in Illinois old enough to read has one chance in a hundred of reaching the age of 90, one chance in ten of arriving at 80 and one chance in three of celebrating his 70th birthday. Furthermore, females have one chance in eight of living to be 80 or more while the male has one chance in twelve of joining the octogenarian club. These conclusions are indicated by the mortality statistics for last year, made public here today by Dr. Andy Hall, state health director, who points out that a considerably larger number of people than formerly are reaching the three score and ten limit in spite of higher death rates among those past 40.

Out of 90,192 people who died in Illinois last year 23,709 were over 70, and 8,333 were less than one year old, . . . . Thus more than 35 per cent of the total mortality were included in these age groups. That suggests that people who have survived their first year have at least one chance in three of seeing 70. Last year 25 per cent of all deaths, including infants, were among people past 70 against 24 per cent in 1923 and only 16 per cent in 1918. The effect of the . . . ."

The complete release is twice as long as the above. *Free*.

#### CHILDREN AND SCHOOLS

"Brownie Health Rules." Massachusetts Department of Health. *Free*. 2-page sheet. Six Brownie outline pictures with brief captions: "I wash my hands before I eat," etc.

"Dental Health Stories, Songs and Rhymes." *University of Iowa Extension Bulletin*, Iowa City, Ia. Sept. 1, 1929. 10 cents.

"A Map For Young and Old Picturing A Few Of The Many Accidents That Might Be Prevented By The Use Of Caution," a picture map issued with *Safety Education*, 1 Park Ave., New York, N. Y. Sept., 1929. 10 cents. Outline map of U. S. with accidents humorously pictured from coast to coast. Too small for wall use "as is," but enlarged copy could be made with groups of children reproducing the dif-

ferent units to be pasted upon the background.

"Physical Education in City Public Schools," by M. M. Ready of Bureau of Education. 15 cents of Superintendent of Documents, Washington, D. C.

"School Hygiene" number of *Commonwealth*, Massachusetts Department of Public Health. Apr.-June, 1929. "What Milk in the Schools?" etc.

#### REPORTING

The 16-page pamphlet, "Signs of the Times: A Brief Resumé of Social Hygiene in 1929," and the accompanying letter from the American Social Hygiene Association, 370 7th Ave., New York, N. Y., is the "report of the month." Copy free. Some of the items to be noted: title, size, paper, marginal statistical references, condensed copy, and letterhead paper. No financial statement.

Did Commissioner Wynne set a new record in health reporting? In exactly one hour after the close of the statistical year of the New York City Department of Health, which ended at 12 noon, December 31, 1929, a summary report was on the Mayor's desk. Explaining the promptness in submitting his report Commissioner Wynne said:

Successful health administration depends on the keeping of all health facts up to the minute. Our statistics are therefore arranged so that we can compile at a moment's notice the health history of the city.

A copy of the 7-page release, which appeared in morning newspapers, Jan. 1st, free.

#### DIPHTHERIA

The items listed below contain more or less material useful in various forms. A phrase, a paragraph, a statistical comparison, or other element may be utilized in talks, news stories or printed matter. Among the excellent publicity material issued during the past three

years a health officer or executive should find, practically ready-made, the copy and plan for a folder or leaflet to serve his purpose. Why not utilize the good and fine material which has already been worked out?

Diphtheria is the subject of the Nov. 5, 1929, issue of *Chicago's Health*, Dept. of Health.

"Banish Diphtheria," by Shirley W. Wynne, M.D. A readable "day before Thanksgiving" radio talk, with well done historical tie-up. Well worth getting into your files. Free of Health Dept., New York, N. Y.

"Diphtheria Is Preventable" is the new illustrated 4-page folder in color issued by the Metropolitan Life Insurance Co., 1 Madison Ave., New York, N. Y.

Diphtheria vs. protection is argued in the Nov. 23 and Dec. 7, 1929, issues of *Weekly Health Review*, Detroit Dept. of Health. Copies free.

In the *Middletown Times-Herald* (N. Y.) for Nov. 14 boxed advertising space announced the Saturday morning toxin-antitoxin clinic of the Health Department. Each box occupied part of the advertising space of a local merchant. A dozen other merchants have promised to do likewise.

The New York State campaign: Oct.-Nov.—scenario prepared for talkie for use in 1930 . . . leaflet prepared for participants in state-wide high school poster contest . . . groups of posters from past contests and selected commercial posters offered to contesting schools . . . Nov.-Dec.—Plans for 1930 campaign reviewed by State Diphtheria Conference Committee. . . . For this 5th year of the 5-year project, effort will be concentrated on the 12 or 15 larger cities of the state.

#### REGRETTABLE BUT TRUE

A diagram of activities, better than the usual sort, appearing in an annual

report, faces the wrong way so that the reader must change the pamphlet from the left hand to right to be able to look at the diagram.

## HONORABLE MENTION

To American Social Hygiene Association: For "Signs of the Times," an outstanding example of a condensed report of varied activities.

To Cincinnati Public Health Federation: For using "Activities of the Public Health Federation" as the cover page title of an annual report.

## LETTERS

An original and strikingly effective layout for the two inside pages of a 4-page letterhead came from the New York Tuberculosis and Health Association, 244 Madison Ave., New York, N. Y. The 8 photographs, with brief captions, present as many age or occupational groups which receive health service. The captions illustrate an effective simplicity of style worthy of extended use. "The Chain of Life" on the back page is an attractive idea, but use it somewhere else. As used with other copy, it crowds the fourth page, which would be heavily laden without it. Probably a smoother brand of dull-finished paper would have given better results—less "dirty" looking. Ask for the 1929 Christmas seal letter and enclose 2-cent stamp.

## MAGAZINE ARTICLES

See under "Health" in midmonthly issues of *The Survey* for popularly written comment on health problems and activities.

Practically every issue of *Literary Digest* carries several good sized extracts from magazine articles on health topics, and selections from medical journals and public health periodicals.

"Before You Drink a Glass of Milk," by Paul De Kruif. *Ladies' Home Jour-*

*nal*, Sept., 1929. For discussion of this article see *Health News*, New York State Department of Health, Oct. 21, 1929.

"College Blues," by Karl A. Menninger, M.D. *Survey*. Sept. 1, 1929. Mental hygiene for students.

"How To Prepare For The Winter's Work," by G. F. Alsop, M.D. *Woman's Journal*, 171 Madison Ave., New York, N. Y. Sept., 1929. 25 cents. "For lessening the danger of indoor living."

"If Your Baby Must Be Fed Cow's Milk Be Careful!" by W. R. Ramsey, M.D. *Farmer's Wife*. Oct. 1, 1929.

"Machine Age Adds Quota to List of Medical Fakes." *New York World*. Sept. 29, 1929. "The modern witch doctor's stock in trade."

"The Patient's Dilemma," by Joseph Collins, M.D. *Harpers*. Sept., 1929.

"A Psychiatric Social Worker Looks at Literature," by F. D. Teller. *Survey*. Oct., 1929.

"Stop That Noise!" by Prof. D. A. Laird. *New York World Sunday Magazine*. Oct. 13, 1929. "It is taking unsuspected toll of lives."

"When You Count the Calories, Count the Consequences, Too!" by Dr. W. H. Eddy. *Good Housekeeping*. Aug., 1929. What "every dieter should read."

## DATES AHEAD—1930

Mar. 30–Apr. 6—National Negro Health Week. U. S. Public Health Service, Washington, or Tuskegee Institute, Tuskegee Institute, Ala.

April—Early Diagnosis Campaign. See any tuberculosis or kindred association or committee.

April 27–May 3—Better Homes Campaign. Better Homes in America, 1653 Pennsylvania Ave., Washington, D. C.

May 1—May Day and Child Health Day. American Child Health Association, 370 Seventh Ave., New York, N. Y.



Nearly all communities, large or small, will observe one or more of the above. In some cases other health activities will present active participation, but usually local health agencies can get on record their interest and sympathy, and in many cases they can play a prominent part.

#### GRAPHIC STATISTICS

Has this been used: a diagram of mortality rates illustrated with sketches or silhouettes, on or above the bars or lines, representing individuals at say 1 year, 2-5 years, 6-10, 11-15, 16-20, 21-30, etc.? These illustrations do not represent the rates, but are varied in size only enough to suggest differences in age. *Please tell the editor where you have seen this idea used.*

#### TRY ONE OF THESE?

A section sliced from a city map, in several colors, is the interest-arousing cover design for an 8-page pamphlet issued by the Regional Plan of New York, 130 East 22d St. *Free.* The pamphlet title appears on a pasted slip  $2\frac{3}{4}$  by  $1\frac{1}{2}$  inches. A pile of similar maps was cut into sections 13 by  $8\frac{1}{2}$  inches, thus providing, when folded once, the cover for a pamphlet  $6\frac{1}{2}$  by  $8\frac{1}{2}$  inches in size. In making use of the idea care should be taken to select paper and ink for the label to secure contrast with the map background on which it is pasted.

A Buffalo department store has been running a series of advertisements in the form of letters from "Cynthia" to "Dear Dorothy." These letters are rather simple and straightforward in style without any straining after cleverness. Why not write about health in similar fashion?

To advertise your convention: make

up as a handbill—printed only on one side of the paper—reproducing a group of supposed clippings, the copy written in newspaper style, including report that a local board of directors has voted to send delegates; report that delegates have started; reports of meetings and other features of the coming convention, all written up as of yesterday. This device gives opportunity to freshen the trite sayings about convention values and to bring out some of the high lights of the meeting.

A Christmas greeting and a follow-up appeal to buy Christmas Seals—all in imitation penmanship on a postal card—was used by the Denver Tuberculosis Society. *Copy free.*

"Why Sanitary Engineers Are Needed" was the subject of a recent radio talk from the New York State Department of Health. *Copy free.* Various city and state departments describe divisions or bureaus and activities from time to time. Why not check all such efforts in 1929 and note what may have been overlooked?

"DEATH PLAGUE STRIKES THE PLAINFIELDS—Over 4,000 Stricken as Smallpox Threatens . . ."—these are part of headlines from the miniature imitations of the upper halves of two issues of Plainfield (N. J.) *Courier-News*, accompanied by this statement on the cover of a Community Chest folder with a larger page size: "If Plainfield *Courier-News* Carried This Story Tomorrow Millions of Dollars Would Be Raised Over Night!" *Copy for 2 cents.*

#### LISTS

City health officers—those in cities of 10,000 and up; state and insular health authorities. In *Public Health Reports*, Washington. Nov. 15, 1929. *5 cents.*

## BOOKS AND REPORTS

Annals of the Pickett-Thompson Research Laboratory, Vol. V—  
London: Baillière, Tindall and Cox,  
and Baltimore: Williams & Wilkins,  
1929. 392 pp. Price, \$10.00.

This volume, entitled *The Pathogenic Streptococci—Their Rôle in Human and Animal Disease*, includes three monographs. The first treats of streptococci in oral and dental sepsis. A review of publications, as well as the authors' findings, affords ample proof of the important part played by the streptococci in these conditions. They are the most common bacteria found in the healthy mouth. The unique contribution of this monograph lies in its emphasis on the idea that the inadequate methods heretofore employed for identifying these streptococci should be supplemented or replaced by photographic studies of the colonies from direct cultures on Crowe's chocolate agar medium. The authors believe that it is possible to identify with certainty several varieties of streptococci at sight through a stereoscopic microscope. They admit that every given species is capable of considerable colony variation and that the primary colonies of the first isolation may show a difference from those of the first subculture, one of the most variable being *Streptococcus mutans*.

There is no final statement as to the newer suggested methods, but there is a courageous attempt to show progress in a new direction in bringing order out of chaos.

Dentists, doctors and research students will find an excellent résumé of knowledge concerning streptococcal glossitis and stomatitis, dental caries, pyorrhea alveolaris and its treatment by

vaccine therapy, as well as the relation of oral and dental sepsis to rheumatic and cardiac infections and glycosuria.

The second monograph deals with streptococci in tonsillitis and pharyngitis. It is a valuable presentation of the present knowledge of the function, pathology and bacterial flora of the tonsils, as well as the large problem of streptococcal throat infections. It includes a résumé of the work on the effects of tonsillectomy and X-rays, as well as the treatment of tonsillitis, vaccine therapy, carriers, and other related subjects.

The third monograph is concerned with streptococci in puerperal sepsis and septic abortion.

Despite the improvements in surgical technic and the advance of antiseptics, the maternal mortality rate has but little altered during the last decade, and sepsis is still responsible for approximately half the deaths in childbirth (p. 349).

The authors have reviewed the various bacteriological researches into the etiology and sources of puerperal sepsis, and find:

... the evidence is overwhelming that acute puerperal sepsis is almost invariably caused by streptococci.

The literature on the use of vaccine and serum therapy shows that the results not only vary but are disappointing, though not unfavorable, the best results being obtained from the use of autogenous streptococcal vaccines. Literature on chemo-therapy in puerperal fever is well presented.

There are about 1,150 references to literature, and 46 plates of excellent photographs of colonies and organisms.

The volume will prove an incitant to careful thought and research on the

three important phases of disease here presented. With the preceding volumes, it constitutes the most extensive study of the streptococci yet published, and is indispensable to bacteriologists.

ESTHER W. STEARN

**Aids to Zoology—By Harry Lister.**

*New York: Wood, 1929. 214 pp., 29 figs. Price, \$1.50.*

This is a condensed handbook of the structure and life histories of a series of animal types with a brief account of histology, embryology and evolution. It includes a number of parasitic species.

C. A. KOFOID

**Epidemic Encephalitis. Etiology, Epidemiology, Treatment—Report of a Survey by the Matheson Commission. New York: Columbia University Press, 1929. Distributed by Dr. William John Matheson and the Matheson Commission on Encephalitis Research, 706 W. 168th St., New York, N. Y.**

Few diseases have excited more interest during the past 10 years, and none have been more puzzling than encephalitis. The profession generally will therefore welcome this study, which has been made under the direction of a commission financed by Dr. William John Matheson, and carried out under the direction of Dr. Josephine B. Neal, who has not only made a thorough survey of the literature, but has visited many parts of Europe where personal interviews with those best informed on the subject were held, and studies of patients as well as pathological specimens conducted. The names of those consulted in this country as well as Europe are convincing evidence of the authoritative character of the testimony collected.

One hundred and five pages are given to etiology, 30 to "other types" of encephalitis, 42 to treatment, and 222 to epidemiology. The rest of the book—

with the exception of a good index—some 428 pages, is given to a well arranged bibliography.

Too much cannot be said of the excellent character of this study, not only in design, but in the way in which it has been carried out and is now presented. One is inclined at first to be disappointed at the lack of conclusions, but certainly nowhere else is there to be found such a collection of information concerning this obscure disease. The commission has rightly felt that a knowledge of the facts is the foundation on which future work must rest. It would be arrogant for the average reviewer to draw conclusions when the commission and its director have not seen fit to do so.

In the foreword, we are told that at the suggestion of Dr. Matheson, the commission is continuing the work, and has undertaken a number of studies on causes, treatment and results; so we can look forward confidently to further contributions which will doubtless add greatly to our knowledge and which, we trust, will allow of conclusions useful to the average practitioner.

The present volume being a collection of facts and figures, does not lend itself readily to review, though it is of great value to all interested in the subject.

The chapter on Etiology gives us the stages through which the pathological investigations have passed; that on epidemiology gives a section to practically every country in the world, and includes age, sex, and seasonal distribution. The cases reported from England and Wales exceed those of any other country by some 5,000.

The work so far is deserving only of the highest praise. The medical profession particularly, but also the public, who are the sufferers from the disease, owe a debt of gratitude to Dr. Matheson, who has financed this endeavor, as well as to the commission which has the work in charge, and especially to Dr.

Neal, who has not only directed the work, but personally carried out most of it.

The printing and make-up of the book are excellent. M. P. RAVENEL

**Backgrounds of Biology**—By John Giesen and Thomas L. Malumphy. Milwaukee: Bruce, 1929. 278 pp., 66 figs. Price, \$2.50.

This is a textbook of elementary biology prepared by teachers in Holy Cross College. It is diagrammatic in its presentation of its facts and in places dogmatic in its assertions of the limitations and inadequacy of many current biological hypotheses including, for example, Darwinism, the tropism theory of Loeb, and eugenics. Orthodox biologists will find it interesting reading. There are excellent chapters on infection and immunity. C. A. KOFORD

**The Blood Picture and Its Clinical Significance (Including Tropical Medicine)**—By Prof. Dr. Victor Schilling. Translated and edited by R. B. H. Gradwohl, M.D. (7th and 8th ed. rev.) St. Louis: Mosby, 1929. 408 pp. 44 ill. Price, \$10.00.

This book portrays indeed the advance made in practical hematology, being unique in composition and of much importance to laboratory investigators and internists, who are interested in the subject.

The first part deals with the technic of blood examination, introducing a new blood test called Guttadiaphot. Part two comprises the theory, morphology and division of the blood picture. The hemogram, which is an outstanding feature, and Arneith's qualitative blood theory are discussed. Part three gives the principles for clinical use of the blood picture, while part four, being a supplementary addition, gives selected examples, demonstrating the practical use of the hemograms.

The author emphasizes the fact that

the cases described are particularly clear cases, selected from very vast material, and that a study of the blood picture is useful even in the simplest cases, since it reinforces the physician's judgment by simple confirmation, or strengthens it in a symptomatic and prognostic manner.

The cases are illustrated by "hemograms," a method devised by the author. A simple classification of the polymorphonuclears is used. The simplicity of the method is very practical and its use should be encouraged. The work is replete with information and very well written. There is a full bibliography of the German literature appended.

ALBERT G. BOWER

**The Commonwealth Fund Activities in Austria. A Record of Collaboration for Child Health, 1923-1929**—By William J. French, M.D., and Geddes Smith. New York: Commonwealth Fund Division of Publications, 1929. 131 pp.

This is an unusually attractive report. It is a record of collaboration, for, as stated in the foreword, the Fund has in no instance endeavored to superimpose its own ideas or methods of health work upon the different Austrian communities to which it has given assistance. Health work is not in a rudimentary stage in Austria, and the Fund has endeavored to make possible a development of the program originating from the Austrians themselves or given a local or national color by them. "American initiative has been needed only to help in clearing the way for a thoroughly Austrian enterprise." The Austrians have their own ideas as to what ought to be done and how it should be done; and for the carrying out of a program they bring "their keen enthusiasms, their native pride, their courtesy and wit, their cheerful poverty, their fears for the future of Austria, and their power to dissociate themselves from their fears and throw

themselves without reservation into the task at hand."

The second guiding principle of the Fund was to limit itself to such lines of activity as it felt would meet the most outstanding need, and render the greatest public service. While the main purpose of the report is to record projects taken up, and accomplishments in the health program, some of its most enlightening features are the sketches presenting the historical background of the nation and of each of the six provinces and districts to which assistance was given.

The starting point for improvement and expansion in many instances was the school health program or an attempt to correlate and improve child health work already being done by a number of agencies. The commendable reductions made in preventable diseases, particularly among children, as well as the result of some specific measures such as the prevention of simple goiter in Voralberg, are clearly indicated.

The important rôle of the midwife in Austria, in contrast with her receding place in America, is set forth; also the contrast between the type of midwife of a few years ago and the one now doing service in Austria. The activities and influence of the home visitor (Fürsorgerin) in Austria are among the most important factors in carrying the benefits of public health to a community. There seems to be no public health worker in America whose functions cover the range of services rendered by this Austrian home visitor.

The report indicates that the future of child health work in Austria is hopeful. "The direction of public health effort to all appearances is firmly fixed; it is the same as that of enlightened governments everywhere. Austria has grave doubts of her future as a nation, but she is determined to safeguard the future of her children."

The report is well written, pleasing to the eye, easily read, and contains 20

exceptionally fine illustrations which add to the attractiveness of the report and supplement the text. JAMES WALLACE

### Second Annual Report of the Metropolitan Drainage Commission of Minneapolis and St. Paul.

In 1927 the Minnesota legislature created the Metropolitan Drainage Commission to study the subject of sewage disposal in the area of Minneapolis and St. Paul. This, the second annual report of this commission, contains its opinions that:

1. The cities of Minneapolis and St. Paul should unite to form a single district for the treatment and disposal of sewage.
2. South St. Paul and Newport should be left out of the district at the present time but should be permitted to contract with it for the disposal of their sewage and wastes.
3. The project for the treatment of all sewage in a single plant in the Pig's Eye Lake district should be adopted, provided equitable financial adjustments of the costs of the intercepting sewers can be made.
4. This conclusion pertains to fixing the annual tax rates in the two cities so as to make them as nearly uniform and equitable during the period of construction as possible.

The report is too long to go into thoroughly, but its preparation warrants its careful review. One striking feature is the finished charts, of which there are 154. These are clear and elucidating and make the report much more readable.

Six plant sites and 20 treatment projects were studied and from a careful comparison of these the conclusion in favor of the Pig's Eye Lake one was drawn. This project utilizes a system of medium level interceptors which will deliver the sewage to the vicinity of Pig's Eye Lake. About 1,000 acres of land are available and the site is suitable for digestion tanks and drying beds, as a large part of it is remote from dwellings. The project permits the construction of either an activated sludge plant or a trickling filter type and provides for complete treatment in 1970.

ARTHUR P. MILLER

# HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

**United States Public Health Service**—The fifty-eighth annual report of the Surgeon General of the U. S. Public Health Service covers the 131st year of its existence. During the fiscal year 1929 there was a constant interchange of sanitary information with other nations through the International Office of Public Hygiene of Paris, the Pan American Sanitary Bureau, and the health section of the secretariat of the League of Nations. Mortality was not so low as in the two previous years when unusually low records were attained. Furthermore, an influenza epidemic, although more mild than in 1920 and 1918–1919, reached a large number of countries.

Meningococcus meningitis was unusually prevalent in the United States during the latter half of 1928 and the early part of 1929. More cases were reported than for any year since 1918. This disease was prevalent in Chinese ports during 1929 and in April and May caused more than the normal number of deaths in England and Wales, Scotland, Germany, and Italy. Typhoid fever and relapsing fever declined and the trend of cholera in India was downward. Yellow fever was reported in Brazil, a severe outbreak occurring in Rio de Janeiro.

In the United States, a birth rate of 19.7, a death rate of 12.1, and an infant mortality rate of 67 are recorded for 1928. There were 38,000 cases of smallpox reported.

It seems strange that year after year more cases of smallpox are reported in the United States than in any other country of the world except British India. Yet this disease can be controlled by vaccination and revaccination, and with the coöperation of the public could be stamped out in the course of a few years.

A reduction of 86 per cent in the

death rate from typhoid fever during the last century, to a rate of 4.8 per 100,000 population, has been brought about largely through the practical application of the principles of modern sanitary science.

The figures show not only the saving of about 47,000 lives in one year, but the avoidance of an incalculable amount of human suffering and economic waste.

In 1928 the death rate from tuberculosis in 42 states was 77.5, the lowest ever recorded, and comparing with a 1900 rate in the death registration area of more than 200.

No instance of the importation of any quarantinable disease occurred during the year. The preventive measures applied by U. S. Public Health Service officers at foreign ports of departure are reflected by the small number of quarantinable diseases on vessels arriving at United States ports.

In spite of preventive measures, and of the decrease in prevalence of venereal diseases which must have taken place since the World War, it is estimated from extensive studies that there are constantly under treatment or observation by physicians and clinics in the United States approximately 474,000 cases of gonorrhea and 643,000 cases of syphilis. It is also estimated that 697,000 cases of gonorrhea and 422,000 cases of syphilis seek treatment for new infections in the course of a year. The Service has continued its efforts to reduce the prevalence of venereal diseases, through coöperation with state and local health authorities, the carrying on of educational work, and the conducting of research in problems related to the treatment and control of syphilis and gonorrhea.

An impressive list of investigations of public health problems is contained in

the report, including among others cancer studies, milk investigations, trachoma, stream pollution, malaria, industrial hygiene, child hygiene, goiter, nutritional diseases, and undulant fever. An extensive volume of coöperative work was conducted by the Service during the year, including practically all the departments and certain of the independent establishments of the government.

**Rosenwald Fund**—This annual review for the year ending June 30, 1929, presents not only the major activities of the Fund but includes an enlightening discussion of the underlying principles of modern philanthropy. Consideration is given to Negro welfare as a program deserving national support; and to the need of pay clinics and other forms of organized medical services for the general population.

The most extensive group of activities of the Fund during the year was co-operation with southern states and counties in building public schools for Negroes. Assistance has also been given to the development of colored public health nursing work, to proper housing facilities, to the extension of library services, and to the study of various medical problems, including the Cost of Medical Care.

**Cleveland, O.**—The 1928 report of the health division opens with a map showing the health districts of the city and the location of district stations. This map serves to orient the reader. A general mortality rate of 10.27 is recorded on the basis of an estimated population of 1,010,300. A resident birth rate of 14.99 in 1928 compares with a rate of 23.1 in 1920. Births in hospitals to resident mothers have increased during this period from 22 per cent to 44 per cent.

Tuberculosis statistics are analyzed extensively by districts. A death rate

of 85.9 (75.2 pulmonary) in 1928 compares with a rate of 128 (109.8 pulmonary) for the year 1913. A total of 1,688 new cases of pulmonary tuberculosis was reported, and less than 10 per cent of the fatal cases had not been reported before death. During the year there were 263 fatal automobile accidents. Responsibility for these accidents was chargeable to drivers in 43 per cent of the cases, to adult pedestrians in 31 per cent of the cases and to children in 21 per cent of the cases. Over half of the report is devoted to detailed statistical tables.

**Anderson County, S. C.**—This county with a population of 85,000 maintains a health unit consisting of a medical director, a nurse, a clerk and a sanitary inspector. Antityphoid campaigns were directed during the year in sections of greatest prevalence, and 10,824 inoculations were given in clinics. A toxin-antitoxin program undertaken in the fall of 1928 resulted in the immunization of 3,656 children. There were only 2 deaths from diphtheria in 1929.

A Kiwanis clinic for crippled children was held at the county health unit offices. Of 49 children examined, 21 were selected for orthopedic correction. One day each week is devoted to well baby conferences. A goiter survey of high school pupils showed that endemic goiter is not a problem in the county. The health unit maintained a booth at the county fair and featured the "milky way" and the power gained from the use of milk as a food. Some 50,000 pieces of health literature were distributed there.

**Cincinnati Public Health Federation**—Opening with lists of coördinating committee members and organizations represented, the 1928 health federation report of 52 pages contains much interesting information regarding the work of this voluntary agency. Be-

sides the President's report are accounts by the chairmen of councils on cancer control, child hygiene, clinics and dispensaries, day nurseries, heart control, housing, mental hygiene, mouth hygiene, nursing, social hygiene and tuberculosis.

According to an excellent chart of the Federation, each council is made up of the professional and lay people interested, and meets monthly. A council on health education has recently been formed. It is gratifying to note that the President of the Academy of Medicine has announced a plan to encourage physicians to perfect themselves in making physical examinations, and that the Federation will coöperate by urging the public to consult competent physicians for an annual check-up.

**New Jersey**—A popular review of health activities of the State Health Department for the year ending June 30, 1929, is contained in the September-October *Public Health News*. The control of physical connections between public potable water supplies and other unapproved supplies was secured by a new act of the State Sanitary Code. This regulation prohibited new cross connections and required that those in use be equipped with all bronze double check valves of an approved type if they are to be retained. Such check valves are allowed only on yearly permit, which must be approved by the local board of health, the local water department and by the State Department of Health.

The state-wide diphtheria prevention campaign was continued and resulted in the immunization of over 125,000 children at public clinics. During the previous year approximately 133,000 children received similar treatments. Public offers of toxin-antitoxin or toxoid treatments were made by 290 of the 556 cities, boroughs and townships in the state up to the first of the year 1929. Among the important factors in this campaign have been the program

of education and the clinic demonstrations carried on by state and local health officials for several years, and the active participation in the campaign last year by the New Jersey Committee for the Prevention of Diphtheria.

It is stated that the education and the direction of the work of midwives, which has been carried out in the state for many years, has resulted in fewer midwives and in greatly improved standards of practice and equipment. In the last 10 years, the proportion of total births attended by midwives has decreased from 42.2 per cent in 1918 to 18.1 per cent in 1928. Only 4 per cent of the puerperal deaths were among mothers attended by midwives.

The annual courses offered jointly by Rutgers University and the State Department of Health for the professional education of persons engaged in public health work in New Jersey were attended last year by 42 health officials. At the 2-weeks intensive course for sewage plant operators, held in midwinter, 19 students were given laboratory experience and lectures on sewage treatment practice and theory.

The summer courses for health officers, inspectors and nurses, which began in June, gave practical instruction to 23 employees of local boards of health or of other organizations in New Jersey.

**New Haven, Conn.**—The 1928 report of the department of health opens with an organization chart showing the various bureaus, staff and total budget, in addition to coöperating organizations, voluntary and official. This city with a population of 187,867 reports a resident death rate of 10.3 and a birth rate of 16.2, with an infant mortality rate, corrected for residence, of 53.4 and a tuberculosis rate of 54.3.

Early in the year, exposure to 5 cases of smallpox, one of which was a resident, stimulated an active vaccination cam-



paign. Twelve vaccination clinics were established and the manufacturing and commercial groups coöperated. During a period of a few weeks, over 100,000 people were vaccinated, including 10,000 school children. During the year there were 170 cases of smallpox in the state of Connecticut with but a single case in the City of New Haven.

There were 6 deaths from diphtheria, the largest number since 1923, when toxin-antitoxin immunization work was

undertaken. There were no deaths from typhoid or scarlet fever. Over 4,000 children, including 1,900 pre-school children, were given 3 immunization doses against diphtheria. There are now some 40,000 considered as protected against this disease. An outstanding feature of the report is a careful analysis of the problem of tuberculosis and a comprehensive report of the tuberculosis bureau, which will be of interest to health officers.

## BOOKS RECEIVED

- THE DIAGNOSIS OF HEALTH. By William R. P. Emerson. New York: Appleton, 1930. 272 pp. Price, \$3.00.
- THE HEALTHY MIND. Edited by H. B. Elkind. New York: Greenberg, 1929. 269 pp. Price, \$3.50.
- PHYSIOLOGY AND HEALTH. By C. E. Turner. New York: Heath, 1929. 282 pp. Price, \$1.00.
- HOME NURSING AND CHILD CARE. By C. E. Turner, N. J. Morgan and G. B. Collins. New York: Heath, 1930. 282 pp. Price, \$1.20.
- THE VILLAGE DOCTOR. By Sheila Kaye-Smith. New York: Dutton, 1929. 266 pp. Price, \$2.50.
- THE ART OF RAPID READING. By Walter B. Pitkin. New York: McGraw-Hill, 1929. 233 pp. Price, \$2.50.
- PHYSIOLOGY FOR NURSES. (2d ed.) By William Gay Christian and Charles C. Haskell. St. Louis: Mosby, 1929. 153 pp. Price, \$2.00.
- PRACTICAL PSYCHOLOGY AND PSYCHIATRY. (6th ed.) By C. B. Burr. Philadelphia: Davis, 1930. 378 pp. Price, \$2.75.
- THE ELECTRICAL CONDUCTIVITY OF THE ATMOSPHERE AND ITS CAUSES. By Victor F. Hess. New York: Van Nostrand, 1928. 204 pp. Price, \$4.00.
- HEALTH AND MEDICAL CONDITIONS IN AMERICAN PRISONS AND REFORMATORIES. By Frank L. Rector. New York: National Society of Penal Information, 1929. 282 pp. Price, \$2.50.
- BERGEY'S MANUAL OF DETERMINATIVE BACTERIOLOGY. (3d ed.) By David H. Bergey. Baltimore: Williams & Wilkins Co., 1930. 589 pp. Price, \$6.00.
- THE PRINCIPLES OF BACTERIOLOGY AND IMMUNITY. 2 Vols. By W. W. C. Topley and G. S. Wilson. New York: Wood, 1929. Vol. I, 587 pp. Vol. II, 1300 pp. Price, \$15.00.
- DISEASE AND THE MAN. By George Draper. New York: Macmillan, 1930. 270 pp. Price, \$4.50.
- FOUNDATIONS OF MENTAL HEALTH. By Leonardo Bianchi. New York: Appleton, 1930. 273 pp. Price, \$2.50.
- HANDBOOK OF REFRIGERATING ENGINEERING. By W. R. Woolrich. New York: Van Nostrand, 1929. 331 pp. Price, \$4.00.
- ORAL HYGIENE AND RECENT RESEARCH WITH SPECIAL REFERENCE TO ACCESSORY FOOD FACTORS AND THE INCIDENCE OF DENTAL CARIES. (2d ed.) By J. Sim Wallace. London: Bailliere, Tindall & Cox, 1929. 228 pp. Price, \$3.00.
- THE HEALTH-CARE OF THE BABY. (18th ed. rev.) By Louis Fischer. New York: Funk & Wagnalls, 1930. 248 pp. Price, \$1.00.
- IF PARENTS ONLY KNEW. By Elizabeth Cleveland. New York: Norton, 1929. 152 pp. Price, \$1.75.
- NURSING IN EMERGENCIES. By Jacob K. Berman. St. Louis: Mosby, 1929. 160 pp. Price, \$2.25.
- GETTING WELL AND STAYING WELL. (2d ed.) By John Potts. St. Louis: Mosby, 1930. 221 pp. Price, \$2.00.
- OUR BABY'S FIRST SEVEN YEARS. Compiled by Hermien D. Nusbaum for The Mother's Aid of The Chicago Lying-in Hospital. Chicago: Reilly and Lee Co., 1928. 85 pp. Price, Keratol Cloth, \$2.50; Silk Moire, \$4.00.
- PSYCHOLOGY, NORMAL AND ABNORMAL. By J. W. Bridges. New York: Appleton, 1930. 552 pp. Price, \$3.50.

# A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

**Immunizing Cows against Tuberculosis**—Swiss cows were treated experimentally with "Friedmann's Bovine Medicine" (the Friedmann of turtle bacillus notoriety) and with BCG vaccine. Post-mortem findings "do not permit the conclusion that Friedmann's medicine had unfailing preventive power." But clinical examination of the vaccinated (BCG) animals seemed to indicate increased resistance against tuberculosis.

BAER, H. Immunization against Bovine Tuberculosis with BCG and Friedmann's Vaccines in the Canton of Zurich, Switzerland. *J. State Med.*, 38, 1: 48 (Jan.), 1930.

**Irradiated Ergosterol**—Cod liver oil alone prevented or cured rickets in nearly as high a percentage of children as did the oil plus irradiated ergosterol. The latter alone in equivalent dosage was not so efficient as the plain cod liver oil.

BARNES, D. J., *et al.* The Comparative Value of Irradiated Ergosterol and Cod Liver Oil as a Prophylactic Antirachitic Agent When Given in Equivalent Dosage According to Rat Units of Vitamin D. *Am. J. Dis. Child.*, 39, 1: 45 (Jan.), 1930.

**Changing Death Causes**—Massachusetts mortality statistics are presented to show the changing trends through three decades. The analysis provides texts for a hundred health sermons.

BIGELOW, G. H., and HAMBLIN, A. Changing Causes of Deaths. *New Eng. J. Med.*, 202, 5: 215 (Jan. 30), 1930.

**Industrial Sickness Rates**—Illnesses lasting more than a week are

compiled from 35 industrial sick benefit associations. The average annual rate is 103.5 per 1,000. Respiratory diseases caused over 42 per cent of cases. Other valuable statistical findings are deduced.

BRUNDAGE, D. K. Sickness among Industrial Employees. *Pub. Health Rep.*, 45, 3: 107 (Jan. 17), 1930.

**Industrial Health**—The sanitarian's opportunity to individualize his health program through industrial hygiene is set forth.

CANNON, O. A. Health Opportunities in Industry. *Canad. Pub. Health J.*, 21, 1: 1 (Jan.), 1930.

**Isolating Tubercle Bacilli**—Oxalic acid, 5 per cent, instead of sulphuric acid, 6 per cent, is suggested for isolating bacilli from sputum because it is less toxic for tubercle bacilli and has a greater germicidal effect upon contaminants.

CORPER, H. J., and UYEI, N. Oxalic Acid as a Reagent for Isolating Tubercle Bacilli and a Study of the Growth of Acid-Fast Non-pathogens on Different Media with Their Reaction to Chemical Reagents. *J. Lab. & Clin. Med.*, 15, 4: 348 (Jan.), 1930.

**Food Handler's Examinations**—Eight years' experience in examining food handlers in the city of Newark (N. J.) is reported in an excellent paper by the Health Officer of that city whose matured opinion is that it is well worth while and that such examinations have come to stay.

CRASTER, C. V. The Medical Examination of Food Handlers. *Pub. Health (Great Britain)*, 43, 4: 102 (Jan.), 1930.

**Health Education Through Biology**—An "all sustaining motive," not found in the fear of disease, must be the basis of all health education. The author finds it in a biological setting. It is to be regretted that this stimulating paper is not reprinted in an American publication where our own health educators might see it.

HALL, J. Health Education. *J. Roy. San. Inst.*, 50, 7: 450 (Jan.), 1930.

**Hemorrhagic Diphtheria in Canada**—This story of 70 cases of fatal diphtheria may prove useful ammunition for health workers who are stimulating the general use of toxin-antitoxin.

HANNAH, B. Hemorrhagic Diphtheria. *Canad. Pub. Health J.*, 21, 1: 9 (Jan.), 1930.

**Carbon Monoxide Poisoning**—A committee report which finds that educational measures to prevent carbon monoxide poisoning are valuable but insufficient. Preventive regulations are suggested. Recommendations for the resuscitation of victims are also included.

HENDERSON, Y. The Dangers of Carbon Monoxide Poisoning and Measures to Lessen These Dangers. *J. A. M. A.*, 94, 3: 179 (Jan. 18), 1930.

**Worth-while Annual Reports**—What should be included in health reports and how it should be presented is the theme of this all too short paper for New Jersey health officers. The message is as badly needed in every other state of the Union. It should be widely read.

HISCOCK, I. V. The Purposes, Contents and Preparation of Health Reports. *Pub. Health News (N. J.)*, 15, 1: 4 (Dec.), 1929.

**Diet for Underweight Adults**—Will cod liver oil and milk, when supplementing the diet of underweight adults, decrease "colds," increase body weight, improve efficiency, correct abnormal physical conditions? The an-

swer of this demonstration is: yes, in part.

HOLMES, A. D., *et al.* The Economic Value of Cod Liver Oil and Milk as Dietary Supplements for Underweight Adults. *New England J. Med.*, 202, 5: 225 (Jan. 30), 1930.

**Smallpox Experience in Holland**—A sailor coming from a Dutch colony in the Indies brought alastrim (mild smallpox) with him. The disease spread, assuming a graver aspect and causing some deaths among people who had never been vaccinated or who had been vaccinated many years before.

JITTA, N. M. J. The Smallpox (Alastrim) Epidemic in Holland. *Pub. Health Rep.*, 45, 2: 66 (Jan. 10), 1930.

**BCG Status**—The pros and cons of this lively controversy seemed to be presented impartially. BCG gives protection, but it is too early to decide how much. It may be not without danger; hence the general use cannot be recommended. Even scientific people find it difficult to examine a cold subject of fact objectively and without bias, concludes the author.

KLEINSCHMIDT, H. E. What Is the Status of BCG? *T. Nurse & Hosp. Rev.*, 83, 6: 805 (Dec.), 1929.

**Water-borne Disease on Ships**—An interesting account of a typhoid fever outbreak among passengers on a lake steamer due probably to by-passing polluted water about the drinking water still.

MENDELSON, I. W., *et al.* Water-Borne Disease Epidemics on Ships. *J. Am. Water Works A.*, 21, 12: 1660 (Dec.), 1929.

**Canadian Health Legislation**—This brief statement of the history of health legislation in a Canadian province presents some interesting contrasts in public attitude toward health promotion.

RIDDELL, W. R. Health Legislation in the Province. *Canada Lancet*, 74, 1: 13 (Jan.), 1930.

**Anorexia in Childhood**—Health workers will be most interested in this paper and the discussion following it because of the warning against following blindly "the quart of milk a day" slogan in the case of anorexic children. A warning that deserves general reading.

SCHULTZ, F. W. The Problem of Chronic Anorexia in Childhood. *J. A. M. A.*, 94, 2: 73 (Jan. 11), 1930.

**Financing County Health Work**—Subsidy from extra-county sources is justified. How the aid shall be allotted and apportioned is the subject of an interesting study.

SIBLEY, E., and MOUNTIN, J. W. Apportionment of Financial Aid for County Health Work. *Pub. Health Rep.*, 45, 1: 1 (Jan. 3), 1930.

**Tularemia Up-to-date**—Recent additions to our information about tularemia, here and abroad, introduces a report on new cases.

SIMPSON, W. M. Recent Developments in Tularemia. *J. Lab. & Clin. Med.*, 15, 4: 311 (Jan.), 1930.

**Estimating Antineuritic Potency**—A diet capable of producing polyneuritis in rats allows the determination of minimum curative doses of vitamin B concentrates when injected intravenously.

SMITH, M. I. A New Method of Evaluating the Potency of Antineuritic Concentrates. *Pub. Health Rep.*, 45, 3: 116 (Jan. 17), 1930.

**Physical Impairment in Adults**—The findings of 9,000 physicians making uniform examinations of 100,000 men constitute a valuable picture of physical conditions. These papers are the first of a series of statistical studies.

A summary presented in excellent graphs appears in January number of the Milbank Memorial Fund Quarterly Bulletin.

SYDENSTRICKER, E., and BRITTEN, R. H. The Physical Impairments of Adult Life. (Two papers.) *Am. J. Hyg.*, 11, 1: 73 (Jan.), 1930.

**Hemolytic Streptococci**—Streptococci isolated from typical cases of scarlet fever, erysipelas and septic sore throat cannot by any method now available be separated into specific groups—not a comforting conclusion for those who talk glibly about *streptococcus scarlatinae*, *erysipelatus*, and *epidemicus*.

WHEELER, M. W. Streptococci from Cases of Epidemic Sore Throat, Scarlet Fever and Erysipelas. *J. Prev. Med.*, 4, 1: 1 (Jan.), 1930.

**Human Relations Institute**—This is one of the few lucid accounts of the growth and aims of the Yale Institute of Human Relations. Health workers will be interested in the possibilities in this promising project.

WINTERITZ, M. C. The Institute of Human Relations at Yale. *New England J. Med.*, 202, 2: 58 (Jan. 9), 1930.

**Smallpox Statistics**—Case reports of smallpox for the states and island possessions of the United States, and the provinces of Canada are assembled for comparative purposes. The ready reference may be of use to those who wish to discuss vaccination.

WOODWARD, S. B. An Argument in Favor of Vaccination, with Statistics of the Incidence of Smallpox in the United States, Its Dependencies and Canada. *New England J. Med.*, 202, 3: 122 (Jan. 16), 1930.

## NEWS FROM THE FIELD

NEW YORK HEALTH COMMISSIONER RESIGNS TO BECOME COUNTY HEALTH OFFICER

**M**ATTHIAS Nicoll, Jr., M.D., Fellow of the A. P. H. A., who has been Commissioner of Health of New York State since 1923, resigned on January 16, to become Health Officer of Westchester County at the same salary, \$12,000.

In presenting his resignation to the Governor, Dr. Nicoll gave as one of his chief reasons, "an ambition to organize a county health department on a scale which may ultimately serve as an example not only to other counties of New York but to those of other states."

The first official act of Dr. Nicoll after taking the oath of office as Health Officer of Westchester County was to appoint Richard Slee, M.D., District State Health Officer, as his deputy, at a salary of \$7,000, and William A. Holla, M.D., second deputy, at a salary of \$6,000.

Some of the other positions which are to be filled are: sanitary engineer, \$4,000; veterinarian, \$3,500; supervisor of public health nurses, \$4,000; 4 public health nurses at \$2,100 each, and a statistician, \$3,000. For the first year's expenses the County Board of Supervisors appropriated \$50,000, which the state will duplicate, making the total appropriation \$100,000.

Dr. Nicoll's association with public health activities in New York State dates back to 1908 when he became chief of the Division of Diagnosis in the New York City Department of Health, of which Hermann M. Biggs, M.D., was Chief Medical Officer. Dr. Biggs, who became State Commissioner of Health in 1914, appointed Dr. Nicoll

director of the Division of Public Health Education, December, 1915. He was made Secretary in 1916, Deputy Commissioner in 1917, and on the death of Dr. Biggs in 1923 succeeded him as Commissioner.



MATTHIAS NICOLL, JR., M.D.

Some of the outstanding features of Dr. Nicoll's administration are the close understanding with the medical profession which has been established through his efforts; diphtheria prevention work resulting in much lower morbidity and mortality rates from this disease and the lowest recorded rates in 1929; the promotion of prenatal and child hygiene work; the persistent efforts which have been made to prevent or overcome stream pollution by sewage; and the securing of the purification of a large number of water supplies.

Dr. Nicoll's action serves to emphasize in a striking manner the importance

of the county as the political unit best fitted to administer local public health work.

At the time this article was written, no successor to Dr. Nicoll had been announced by Governor Roosevelt. Dr. Paul B. Brooks, Deputy Commissioner under Dr. Nicoll, is acting health commissioner.

#### THE RAVENEL AWARD IN PUBLIC HEALTH

THERE has been established at the Medical College of the State of South Carolina The Ravenel Award in Public Health, for which Dr. Mazýck P. Ravenel, Professor of Bacteriology and Preventive Medicine, University of Missouri, will annually give a silver cup as the prize. The award has been established as a memorial to those of the name who have advanced science in Charleston and South Carolina, and those who have been connected with the college in the past. This cup will be awarded annually to the student doing the best work in public health during his attendance at the college, providing that the work is of sufficient merit.

The first award will be made at the commencement June 5, 1930, at which time Dr. Ravenel will give the Commencement Address.

#### VIRGINIA PUBLIC HEALTH ASSOCIATION

A MEETING of the Association was held in Richmond, January 9, 1930. The principal speakers from outside were Homer N. Calver, Executive Secretary of the American Public Health Association, who talked on The Functions of a State Health Association, and Blanche M. Haines, M.D., of the U. S. Children's Bureau, who gave an interesting talk on Presidential Interest in Child Health. Charles R. Grandy, M.D., President, and J. Allison Hodges, M.D., President-Elect of the Medical Society of Virginia, spoke on Coöperation between the Physician and the Health Worker.

W. Brownley Foster, M.D., President of the Association, gave an interesting paper on Negro Mortality as his Presidential Address. Papers were also read by C. L. Outland, M.D., L. E. Sutton, Jr., M.D., and Fred J. Wampler, M.D.

New officers elected for the year were: B. B. Bagby, M.D., of Courtland, President; P. M. Chichester, M.D., of Clarendon, 1st Vice-president; and L. J. Roper, M.D., of Portsmouth, 2d Vice-president. Fred J. Wampler, M.D., remains Secretary-Treasurer. Rowena Kneebone, of Richmond, was elected assistant Secretary-Treasurer. Dr. Wampler was elected the Association's representative on the Governing Council of the American Public Health Association.

#### HONG KONG SEEKS TO STOP THE SELLING OF GIRL CHILDREN

AN ordinance has been introduced into the legislative council of Hong Kong which seeks to abolish the system by which parents or natural guardians can sell their daughters into other households to what is frequently a condition of practical slavery. The proposed law forbids such transfer of a minor under the age of 18 except for the *bona fide* purpose of a proposed marriage or adoption according to the Chinese custom, and it also makes it an offense to possess a girl illegally transferred after the coming into force of the ordinance. A law for the protection of the "mui-tsai," as these girls are called, was passed many years ago, but no machinery exists by which it is possible always to make certain whether girls are mui-tsai or not, and the law has remained largely a dead letter.

#### ARIZONA PUBLIC HEALTH ASSOCIATION MEETING

The Arizona Public Health Association will hold its Third Annual Meeting in Phoenix, Ariz., April 15 and 16. A program of interest to health officers,

public health nurses, and sanitary engineers is being arranged. Details of the program can be secured from the Secretary of the Association, Jane H. Rider, State Department of Health Laboratory, Tucson, Ariz.

### 31,500 KILLED BY MOTORS IN 31 STATES IN 1929

**FIGURES** made public on January 15, 1930, by the National Safety Council showed 31,500 persons were killed in automobile accidents in 31 states during 1929.

The total was 13 per cent more than in 1928, the report said, while motor vehicle registration increased only 8 per cent.

California fatalities increased 20 per cent on the basis of a 9 months' comparable period, and New York and Ohio had 17 per cent increase on the basis of an 11 months' comparable period. Oregon, Rhode Island, Delaware, Wisconsin and Vermont show slight decreases in the first 11 months.

More than half the victims were pedestrians.

### RENT ALLOWANCES FOR CHILDREN, GREAT BRITAIN

**THE** National Housing and Town Planning Council of England has suggested that a rebate on the rent of the minimum standard municipal houses should be made in the case of families with three or more children having a maximum weekly income of 55s (about \$13). The English post-war housing schemes have greatly benefited the better paid workers, but they have not emptied the slums because rents for the new municipal houses are too high for the poorer families.

### STANDARDIZATION OF TERM "BLINDNESS"

**DIFFICULTIES** are encountered in attempting to arrive at a total figure for the blind population of the

world, the Health Organization of the League of Nations explains; only a rough estimate can be made, especially in view of the fact that no general agreement prevails as to the exact condition which constitutes blindness. A very conservative figure of 2,390,000 is quoted as a "probable under-estimate" made in 1910, together with the statement that other estimates have been made up to 6,000,000. In those countries where a census of the blind cannot be obtained, it is said, the prevalence of blindness is frequently great.

### CANCER RESEARCH FUND

**A**NNOUNCEMENT that the cancer research fund of the Graduate School of Medicine of the University of Pennsylvania has received an anonymous gift of \$210,000 was made recently by Dr. Josiah H. Penniman, provost of the university.

The gift is the largest single contribution to the cancer research fund, which was established in 1928 through a gift made by Irene du Pont. It has enabled the fund to reorganize its work on a wider and more comprehensive basis and to make notable additions to its research staff.

### CHILD WELFARE MEASURES IN ITALY

**I**N accordance with instructions from the Minister of the Interior of Italy all the prefects throughout the Kingdom have recently called the attention of the mayors and the local health authorities to the need of strict enforcement of the school hygiene regulations. The prefects point out, among other things, the need of talks on the following subjects: Hygiene for the school children, the teachers, and the parents; the keeping of individual health records for the children; and thorough cleanliness of the school rooms. The local health officers are required to visit the schools at least once a month to enforce the sanitary regulations.

#### COST OF MEDICAL CARE UNDER SICKNESS INSURANCE IN GERMANY

IN 1928, the sickness insurance funds of Germany, which take care of cases of illness lasting not more than 26 weeks, spent nearly 203,000,000 Reichsmark (\$48,355,000) on the medical care of non-insured wives and dependent children of insured persons. Of this amount nearly 13,000,000 Reichsmark (\$3,097,000) were spent on dental treatment alone. The cost of the medical care of the 20,000,000 persons insured by these funds amounted to nearly 1,500,000,000 Reichsmark (\$357,300,000). The expenditures of the funds have been steadily increasing.

#### PRIZE OFFERED TO ITALIAN PHYSICIANS

THE Royal Society of Hygiene of Milan has offered a prize of 5,000 lire (\$260) to Italian physicians for the best manual on the physical and mental health of children between the ages of 8 and 15 years. The manual must deal with all subjects relative to the development of the child. Some of the subjects to be discussed are food, clothing, physical and mental training, recreation, problems of sex life, vocational training and guidance, and character education.

It must be written in simple language, suitable for the use of parents, teachers, and other persons dealing with children.

#### CONNECTICUT DIVISION OF MENTAL HYGIENE

THE Division of Mental Hygiene of the Connecticut State Department of Health has been put on a full-time basis under the direction of Dr. McCartney. It is believed that this is the first state department of health to establish a full-time division on mental hygiene.

#### DR. NICOLL HONORARY LIFE MEMBER OF STATE AND PROVINCIAL HEALTH AUTHORITIES

On January 15, Dr. Matthias Nicoll, Jr., former New York State Commissioner of Health, became an honorary life member of the Conference of State and Provincial Health Authorities of North America under a by-law of the organization which provides that ex-presidents of the Conference on the date of retirement from their official positions as state, territorial or provincial health officers shall automatically become honorary life members.

### PERSONALS

ANNIE W. GOODRICH, Dean of the Yale School of Nursing, sailed for the Orient recently to study nursing conditions in the Far East for the Rockefeller Foundation.

DR. HUGH H. SHAW, Health Officer of Utica, N. Y., was recently reappointed to that position by the Mayor.

C. J. DURKEE, Assistant Director of the Division of Public Health Education of New York State, resigned her position recently.

DR. THEOBALD SMITH, formerly Director of the Laboratories of the Massachusetts State Department of Health, has been appointed consultant in Bac-

teriology of the Division of Laboratories and Research of the New York State Health Department.

DR. JAMES EWING, Professor of Pathology at Cornell University Medical School, is the consulting pathologist of the laboratories of the New York State Health Department.

DR. DON M. QUIRK, Health Officer of Watkins Glen and Dix, N. Y., died recently, after a long illness.

DR. SANFORD R. GIFFORD, Omaha, Neb., has been appointed head of the department of ophthalmology at Northwestern University School of Medicine, Chicago, Ill.



MARTHA D. RING, formerly assistant editor of the *International Critical Tables*, has been appointed editor of the Committee on the Cost of Medical Care.

MACENNIS MOORE, publicity director, Wisconsin Anti-Tuberculosis Association, has become publicity secretary of Seattle Community Fund.

VINCENT Y. BOWDITCH, M.D., formerly president of the National Tuberculosis Association, died in Boston, Mass., December 21.

HARRY B. ANDERSON, of the U. S. Public Health Service Hygienic Laboratory at Washington, D. C., died on February 8 of psittacosis, contracted while working with infected parrots.

DR. WALTER W. LEE, formerly of the Indiana State Board of Health, has been appointed Epidemiologist of the Connecticut State Department of Health.

DR. ROBERT F. SEIBERT of New Britain has been appointed Assistant Epidemiologist of the Connecticut State Department of Health.

WILLIAM ROYAL STOKES, M.D., Fellow of the A. P. H. A., of the Bureau of Bacteriology of Baltimore, Md., died on February 10, in Baltimore, of psittacosis.

DR. FRED WILLIAM BROWNING, Health Officer of Hayward, Calif., for almost a quarter of a century, died December 30.

## CONFERENCES

Apr. 15-16, Arizona Public Health Association, Phoenix, Ariz.

May 5-10, First International Congress on Mental Hygiene, Washington, D. C.

June 6-14, National Conference of Social Work, Boston, Mass.

June 12-14, Western Branch of American Public Health Association, Salt Lake City, Utah

June 18-19, State and Provincial Health Authorities of North America, Washington, D. C.

June 20-21, Conference of the Surgeon General, Washington, D. C.

### FOREIGN

May 19-21, Second International Malaria Congress, Algiers, Algeria

June 4-9, Congress of Royal Institute of Public Health, Portsmouth, England

June 21-28, Royal Sanitary Institute, 41st Congress and Health Exhibition, Margate, England

Aug. 3-9, Second International Congress for Sex Research, London, England

Aug. 4-9, International Veterinary Congress, London, England

*A. P. H. A. Fifty-Ninth Annual Meeting*

*Fort Worth, Texas, October 27-30, 1930*

*Headquarters, Hotel Texas*

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## Established Points in a Community Program of Health Education\*

### The Health Department's Program

HENRY F. VAUGHAN, D. P. H., F. A. P. H. A.

*Commissioner of Health, Detroit, Mich.*

THE American Public Health Association in preparing its *Appraisal Forms* for city and rural health work has endeavored to create a measuring stick which incorporates, in terms of group judgment, established points in a communal program of health education. A very important section of the *Appraisal Form* is devoted to popular health instruction in which tangible means of measuring the quantity and the effectiveness of recognized implements of health instruction have been incorporated.

The use of pamphlets, lectures, talks and motion pictures, as well as publicity through daily and weekly newspapers and the publication of bulletins and periodic reports giving account of the activities of the health department and special demonstrations aiming to promote the cause of public health, have all been given numerical value with the view of offering a comparison of the intensity of the educational program in various communities. A further perusal of this same *Appraisal Form* will indicate that throughout the text, in sections devoted to other recognized divisions of health administration, further numerical value is given to methods of procedure which might be placed under the caption "health instruction." The graphic presentation of death rates, the publication of statistical reports, and the use of spot maps and chronological charts, are the invaluable tools of the health educator, and constitute the very foundation stone for the vital statistician and the epidemiologist. The section of the *Appraisal Form* dealing

\* Read before the Public Health Education Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 1, 1929.

with the health of the school child includes features of health education in the schoolroom and the section on sanitation gives tangible value to the instruction of food handlers.

In addition to these well defined uses of the printed page and courses of instruction dedicated to such specific projects as the supervision of food handlers, we must not overlook the most widely accepted factor in the community program of health education—the public health nurse. The effectiveness of the nursing work is measured on the appraisal yardstick by the degree to which the public responds, as evidenced by the attendance at tuberculosis and venereal disease clinics, the frequency with which the mother avails herself of prenatal instruction, and later takes her child to the infant and pre-school clinics. All of these established features of a properly organized health education program are now generally recognized and accepted by the health administrator throughout the land. It is not the purpose of this paper to refer in detail to these implements of education so admirably evaluated by this Association, but rather to discuss certain aspects of the mechanics for the application of these generally recognized principles.

It is one of the prime functions of a health officer, either by himself or through his organized department, to keep the public informed regarding the activities of his organization. This can best be done through the medium of the newspaper by describing in readable and understandable English those routine services which affect the common citizen in his daily life. There is no universal prescription; individuality and personality will vary the pictorial presentation. The people of one city may demand the sensational and unusual. The health officer is never justified in sacrificing the accepted and proven facts of health for the sensational and startling portrayals of unproven and doubtful origin. He is most successful who can mix the dry language and statistics of the scientist with the highly colored portrayals of the modern commercial advertiser.

Many health administrators have worked out a coöperative arrangement with newspaper editors whereby an article describing some feature of the health department's activities is accepted at least once a week. Such article may appear either as a news item or as a special contribution under the name of the author, or as a feature story for the Sunday edition. Pictures are invaluable in reaching the reader.

Too many annual reports of purely statistical character are published by health departments. For the most part they are wasteful of paper. Very few individuals read the details. It seems to be a tradition among health officers to publish a report which may contain

a short introduction by the administrator, but which consists largely of disjointed, poorly prepared and inadequately presented departmental reports. How much better to present a logically yet simply told story of the activities for the past year, giving only the high lights of statistical importance, such as the total death and birth rates and the death rates from the more important causes. The annual report may well be an account of the activities of each of the divisions and sub-divisions of the department, told in an informal and coherent fashion and not as a formal, choppy and jumbled statement from the director of this or that division. Preferably the same author should prepare the entire report, or at least one individual should serve as editor so that phraseology and method will be consistent.

Another important function of the health department is to keep the public informed concerning the prevalence of disease and the possible influence of epidemics on the health of the local community. A weekly bulletin printed by the health department or merely released and published by the newspaper will serve this purpose admirably. It is needless to state that such releases should be made to all papers whether printed in English or foreign languages. In case of epidemic the public should be informed daily of the facts. Health as a news feature has always received due consideration from the newspaper editor. The reader is especially interested in knowing the means of disease prevention and relief in time of epidemic.

It is understood that all health departments do not perform the same services although there is a background common to all. If some of these services, such as centers for maternal, child hygiene and pre-school guidance, tuberculosis and social hygiene are under the supervision of nonofficial agencies, the obligation of the latter in keeping the public informed concerning their activities is as real as would be the responsibility of the health officer were they under his direction. In most instances the nonofficial agencies serve to supplement the official health organization or serve as units of demonstration to convince the public of the need of some particular activity. So far as the communal health program is concerned, both the official and the nonofficial should be considered as a single unit.

The most important task of the health department in developing a health education program is not to take care of the unusual situation which develops during an epidemic period; it is not to describe the mechanics of operating a department or even to notify the public of the prevalence of the various communicable diseases; but rather to build up a system whereby a health consciousness will become established in the mind of each citizen.

After eliminating the multitude of local variables such as climate, race, nativity, color, age, etc., we believe that the death rate from any specific preventable disease reflects the degree to which popular health instruction has stimulated a response on the part of the individual members of the community group and found reflection in the application of the principles of personal hygiene and healthy living. After making the necessary statistical corrections and allowing for abnormal local influences which may result in a more liberal policy with respect to the hospitalization and care of cases at public expense, the tuberculosis death rate may be taken as an index of the local health consciousness with respect to tuberculosis prevention; that is, of the intelligence and learning of the average citizen with respect to the known facts concerning the cure and prevention of this particular disease.

What is true of tuberculosis is likewise true of other communicable diseases such as typhoid fever, diphtheria and scarlet fever. It is especially true of the infant death rate, which serves as an admirable index of the end results of health education in the conservation of child life.

It should therefore be an objective of the health officer to stimulate this condition of health consciousness so that by degrees the citizen automatically incorporates into his daily habits the practice of personal hygiene, and secures for himself and his family the specific means of stimulating artificial protection against such diseases as diphtheria and smallpox. The methods of the commercial advertiser which the medical quacks and charlatans have used so profitably in their business may well be utilized by the health officer. As previously stated, sensationalism should not be utilized at the expense of truth, but a modernistic tendency in the presentation of simple facts will do much to stimulate response from the laymen. The educational program should be built on the best known scientific foundations.

Why not use the successful methods of the commercial advertiser? When an automobile manufacturer is ready to present a new model to the consuming public, he tells the advertising house which handles his account that he has four-wheel brakes, a non-shatterable wind-shield, an automatic lubricating system, demountable tires, etc. The commercial advertiser then builds his story about these new features. He does not have to resort to his imagination but has these new improvements in automotive engineering to offer the public. Throughout his advertising scheme there is a continuity of program—a catchword or phrase which the public learns to associate with his product, such as "Ask the Man Who Owns One," or, "When Better Automobiles are Built, ——— Will Build Them." The automobile manufacturer is

not alone in this field of advertising; it has been adopted for every type of product with such captions as "Not a Cough in a Carload," and "That Schoolgirl Complexion."

Health officers with their academic and professional limitations have made beginnings but much remains to be accomplished. The aptly coined phrase of Biggs: "Public Health is purchasable; within reasonable limits any community can determine its own death rate," has seen wide usage but has not had the personal appeal that has accompanied the undertakings of commercial enterprises.

What has the health officer to sell? For the prenatal case, there is a physical examination with pelvic measurements and a periodic urinalysis; for the mother and child, a safe confinement under hospital conditions, with well trained personnel in attendance; for the infant, supervision of the milk and food, proper rest, suitable clothing, sun-baths, avoidance of excesses. Later there is the period for vaccination against smallpox and immunization against diphtheria. By the time of the first birthday the periodic medical examination should become an accepted fact to be continued through the preschool and school periods, accompanied by the correction of physical defects.

If the health officer could go to the commercial advertiser and present not a new motor car with self-lubricating devices and non-shatterable glass, but a service for the expectant mother, immunization against diphtheria, vaccination against smallpox, the periodic physical examination, great advance could be made in carrying to the parents, and especially the mothers, a consciousness of the fact that they are responsible for the health of their children, and that the application of preventive measures early in life will do much to reduce a high infant death rate and to ward off the communicable diseases so prevalent in the preschool group.

All material of a medical character used in such an educational program should, of course, have the approval of the properly organized medical society. There should be no tendency toward paternalism. The state or city should not perform services which belong rightfully to the parent, except in so far as demonstration is needed and the relief of indigency is compelled.

Attempts have been made in this direction with notable success, although in some instances there has been a tendency to substitute standardized prescriptions for the individual attention of the practicing physician. In our judgment this is a mistake. The condition should never arise whereby reference to a guidebook becomes a substitute for a physical examination at the hands of the family physician—rather should the educational program prove the value of his service.

There should be a continuity of program throughout the entire story, closely interwoven with the personal service and demonstration offered by the public health nurse, for whom the printed page can never serve as a substitute.

The machinery through which such an educational program can be put into effect is variable. There are marriage statistics which afford one means of approach to the prenatal case. There are the birth certificates which give a ready and immediate contact with the mother of the new-born child. Literature delivered by the public health nurse with a word of explanation will obtain better results than when sent through the mail.

We are not endeavoring to mention all the ingenuous methods which have been or may be employed in making contacts in a given field. Suffice it to say that the possibilities are large and, though brave beginnings have been made, no well planned modernistic instruction combining the resources of the public health nurse and the printed page has been consummated. As the nearest approach to what we have in mind we might cite the splendid program inaugurated by Herman N. Bundesen, M.D., as Health Commissioner of Chicago. Doubtless his word did much to stimulate a health consciousness on the part of the people in Chicago and if so it will find reflection in a lowered morbidity and mortality rate for that city.

Let us again repeat that the official and nonofficial agencies must supplement each other in their program of health education. The facts to be presented must be built upon the knowledge which comes to the health officer largely through his division of vital statistics supplemented by research and epidemiological study. The art of modern advertising remains still to be applied in the public health field.

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## Medical Care of School Children in Hesse, Germany

A VERY thorough system of medical care of elementary school and continuation school children has been recently introduced by a Government decree in the State of Hesse. Each pupil must be given a physical examination at the time of entering school; at least once during his school career; and again at the time of graduation, when he is also given vocational advice. In addition, the school physician must also make a less thorough inspection of every child once a year.

The local authorities are ordered to introduce dental care in every school, if possible. Children whose physical condition is not very satisfactory are to be examined at regular intervals to be determined by the school physician. Individual health records are to be kept. The school physician will be assisted in the work by school nurses or welfare workers.—*Deutsche Ztschr. f. Wohlfahrtspflege*, Berlin, Dec., 1929, p. 597.

# Water Treatment With Chlorinated Copperas\*

A. CLINTON DECKER, F. A. P. H. A., AND H. G. MENKE

*Sanitary Engineer, Tennessee Coal, Iron and Railroad Company, Birmingham, Ala.; and Assistant Sanitary Engineer, State Board of Health, Montgomery, Ala.*

DURING January, 1928, it was decided by the Chickasaw Utilities Company and the Alabama Water Service Company to install additional facilities at the Water Works Plant at Chickasaw, Ala. These additions were to include equipment to afford full treatment for color removal, clarification and disinfection.

The Chickasaw Plant is owned by the Chickasaw Utilities Company, a subsidiary of the United States Steel Corporation, and was leased early in 1928 to the Alabama Water Service Company to supply water to the towns of Chickasaw and Pritchard. Chickasaw was built by the United States Steel Corporation during the war to provide housing for the employees of the Chickasaw Shipbuilding Company, a subsidiary of the Corporation. It is about seven miles north of Mobile and has a population of about 2,000. It is un-incorporated. Pritchard, with a population of about 1,500, is about one mile from Chickasaw, and is incorporated.

At the time Chickasaw was built the water works system constructed was large enough to supply the domestic and fire protection requirements of the village and plant.

Investigations of possible sources of supply included wells and surface water. Due to the chemical content of the well water and the large number of wells required, it was decided to use Eight Mile Creek. This stream originates in springs and flows through a heavily cypress wooded territory, which imparts a color ranging from 40 to 130 p.p.m. The turbidity normally varies from 3 to 25, and on very rare occasions reaches 50. The alkalinity ranges from 2 to 5 p.p.m., and constitutes the total hardness. The pH varies from 5.5 to 5.9. The bacterial content is unusually low for surface water, the count being mostly under 100 per c.c. at 37½° C.

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\* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 2, 1929.



The original treatment consisted of sedimentation and chlorination. The sedimentation basin was composed of two units, each having a capacity of 500,000 gal., into which water was pumped with a low lift pump. From this it was lifted to the 200,000 gal.-elevated steel storage tank, being chlorinated as it entered the high lift pump. The high lift pumping equipment consisted of one 1,200 gal. per minute and one 2,000 gal. per minute pump.

After the decision to provide full treatment, including color removal, at this plant, the method of treatment had to be determined. The interested companies, in coöperation with the State Board of Health, undertook experiments to determine the best method. The first experimental work was done in February and April, 1928, and consisted of both bottle experiments and the operation of an experimental filter. The latter consisted of barrel containers and orifice boxes for chemical dosing, mixing trough, coagulating basin, and filter. Water was siphoned from the sedimentation basin and mixed with the chemicals by means of a sloping herring-bone baffled trough. The coagulating basin was of plain lumber—roughly 3 ft. 4 in. x 6 ft. in plan and 6 ft. deep. This was divided into 3 compartments by round-the-end baffles. The filter was constructed from an ordinary hot water tank which gave it a surface of exactly 1 sq. ft. The rate of filtration was controlled by an adjustable hose through raising or lowering the discharge end.

The whole plant was designed to secure maximum flexibility in regard to time of mixing and chemical dosage. We used ferrous sulphate, alum, lime, and soda ash in various quantities and combinations. It was our opinion that the best results of coagulation and color removal were obtained when 3 gr. per gal. of lime and  $5\frac{1}{2}$  gr. per gal. of alum were used. The raw water showed an alkalinity of 2, color 22, turbidity 3, and pH 6.0; the filtered an alkalinity of 8, color 0, turbidity 0, and pH 6.4. On the basis of these findings, it was concluded that a treatment plant could be operated satisfactorily and at a reasonable cost.

Plans were prepared in accordance with recommendations made as a result of the above experiments, and construction work was begun the first week in January, 1929. After the plant had been designed, the possibility of the use of chlorinated-copperas was brought to our attention by L. H. Enslow, Research Engineer of the Chlorine Institute. This, however, did not necessitate any change in the plans except in the chemical equipment.

Laboratory scale experiments preceded the plant scale demonstration made early in April, 1929, and both gave excellent color removal.

The best results were secured by employing 0.7 gr. per gal. of copperas previously oxidized by adding the amount of chlorine theoretically required to oxidize the ferrous iron (1.5 p.p.m.) and, in addition, sufficient to satisfy the chlorine demand of the raw water, making the total application 2.16 p.p.m. At the end of the mixing chamber 0.2 p.p.m. of residual chlorine was present in the coagulated water. Thus, copperas oxidation and prechlorination was effected simultaneously. In passage through the basins, however, the residual chlorine disappeared and the water going on the filters contained none. It was noted that 0.4 gr. per gal. of sodium aluminate was used in conjunction with chlorinated-copperas the floc was somewhat more feathery in appearance and settled more rapidly than that produced by chlorinated-copperas alone.

There was no appreciable difference in the amount of color removal with either of the above methods of coagulation. When sodium aluminate was used, it was introduced in the third compartment of the mixing chamber, theoretically  $3\frac{1}{2}$  minutes after the introduction of the chlorinated-copperas. Coagulation was readily obtained with various dosages of chlorinated-copperas, or with chlorinated-copperas and sodium aluminate. However, the color removal was the factor in determining the minimum dosage, and although coagulation could be obtained with smaller dosage, color removal was not complete except with the amount stated. At times, when the floc seemed to be shrinking in size, our first point of investigation was the mixing barrel where the chlorine was being added to the copperas solution. Usually, upon applying the ferricyanide test for the presence of ferrous iron in the copperas-chlorine mixture leaving the barrel, the blue color was produced, indicating incomplete oxidation of the copperas. Because of this, the chlorine dosage was increased to 2.16 p.p.m. to insure an excess at all times, and likewise provide the prechlorination dosage desired.

Chlorinated-copperas<sup>1,2</sup> is prepared by mixing a solution of ferrous sulphate ( $\text{FeSO}_4 \cdot 7\text{H}_2\text{O}$ ) commonly known to the trade as "copperas" and chlorine water from a chlorinator. The copperas may be fed from a dry feed machine into a solution box, or be made into solution in a tank and fed through orifice boxes. The function of the chlorine is to oxidize the ferrous iron before the solution reaches the raw water. It is evident that the same feed equipment employed for other coagulants is useful with chlorinated-copperas, the only addition being the chlorination equipment.

Provision had been made for introducing lime at various points in the last bay of the coagulating basin and also into the clear well. At

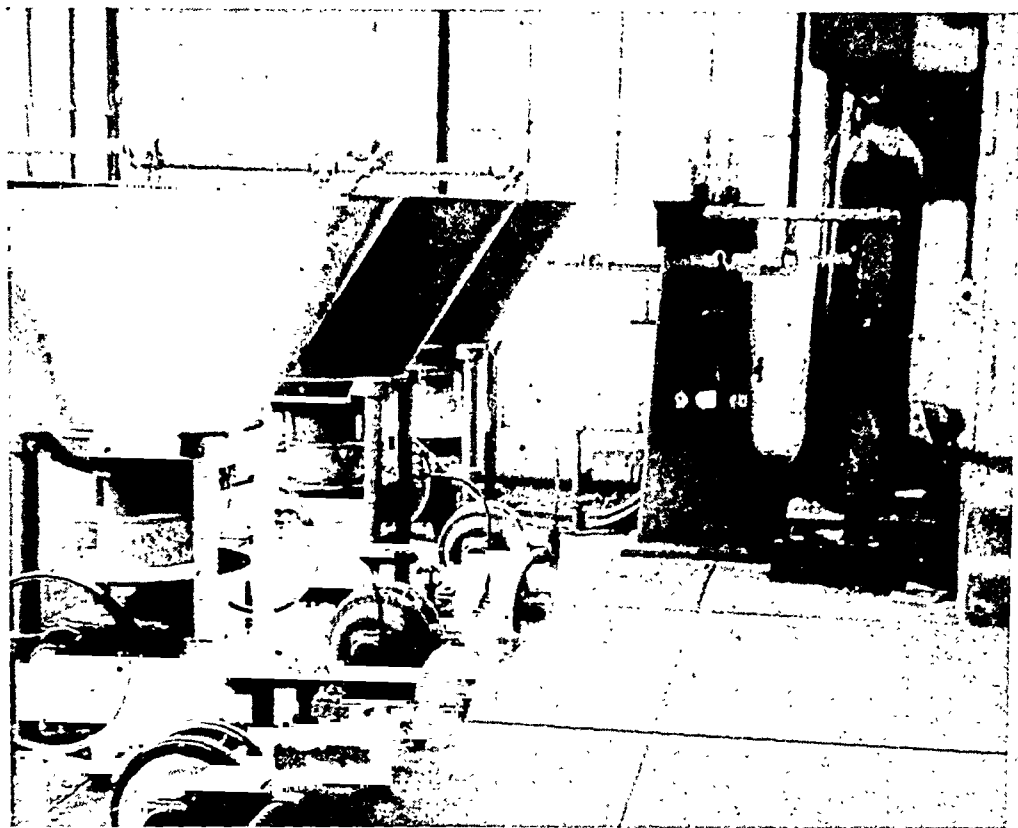


FIGURE I—Chemical Feed Machines

different times, lime was introduced at about 130 ft. and 50 ft. from the filters, and into the clear water well immediately adjacent to the filter effluent pipes. When lime was introduced into the coagulating basin, the final quality of water was not so satisfactory as when it was put into the clear water well. There was a slight increase in color in the latter case, but it was not so great in the finished water as when the lime was introduced into the coagulating basin. In all cases, lime sufficient to adjust the pH up to 7.0 or 7.2 was used. The alkalinity was raised to 7 or 8 p.p.m. The final color averaged about 3 p.p.m., and never exceeded 5. The effluent in regard to color and brilliance was eminently satisfactory. The appearance of the water was impaired when enough lime was added to correct the pH to the desired point of 7.4; i.e., the increase of color intensity was very noticeable when the pH was corrected to values above 7.2. On this account, the final water was left at pH between 7.0 and 7.2. At



FIGURE II—Chemical Feed Machines

times since, the lime application to the filtered water has produced a pH value of 8.0 without serious color increase.

When it had been determined that chlorinated-copperas could be used, the equipment selected was Wallace and Tiernan Type "B" Dry Feed Machines, and Type "M. S. V." Chlorinator (see Figures I and II). No mixing device had been provided for chlorinating the copperas, so when the plant was put into operation, it was necessary to improvise one. A 50-gal. barrel was placed on a bracket immediately adjacent to the first compartment of the mixing chamber. The copperas solution line from the dry feed machine was cut and so arranged as to lead into this barrel, discharging at the bottom, causing a swirling action in the barrel. An outlet pipe from the barrel into the mixing chamber was taken off at the top. Chlorine was introduced through the chlorinator discharge hose at a point near the bottom. The swirling action caused an intimate mixture of the two chemicals and secured the oxidation of the copperas (Figure III).

Complete oxidation of the copperas is the essential part of this process, and in the construction and operation of a plant using "chlorinated-copperas," care and special attention should be devoted to a design which will secure this result. During the operation of the plant, frequent tests should be made to determine that complete oxidation is being obtained. In the design of plants using this treatment the box in which the copperas and chlorine are mixed should be easily accessible for taking samples for the oxidation test. Samples were collected frequently from the chlorinating barrel discharge, and

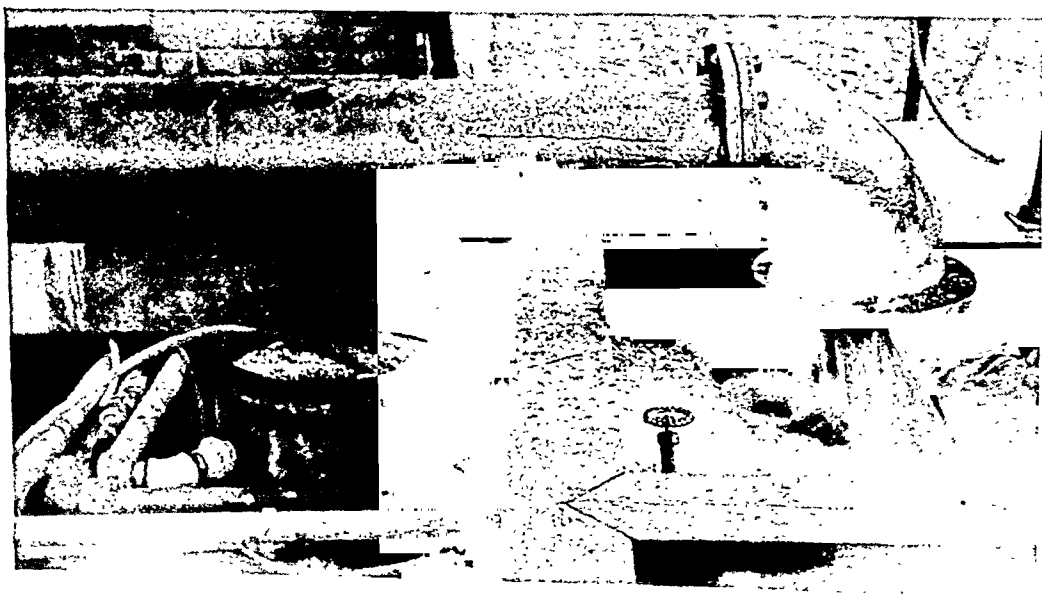


FIGURE III—Barrel in which Copperas is Chlorinated

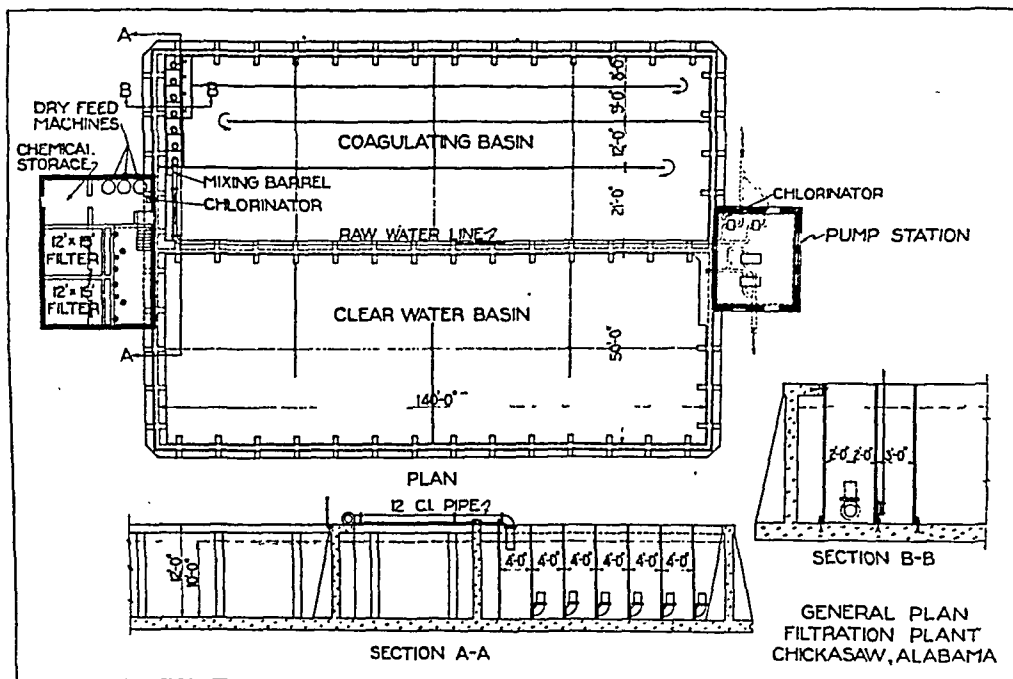


FIGURE IV

the test applied until there was assurance that the copperas-chlorine ratio was being properly maintained and no ferrous iron was being discharged. It is, as already pointed out, far preferable to operate on the side of safety and always have present some excess chlorine, than to err in the other direction.

The mixing chamber and coagulating basin were adjusted to one unit of the original settling basin. The mixing chamber consists of a series of vertical compartments through which the water passes. There were seven compartments, each 4 ft. square in plan and extending to full depth of the coagulating basin, 10 ft. The raw water is introduced over the top of the first of these compartments in a downward direction, leaving at the bottom through a 12 in., 90° bend, and a nipple 18 in. long, and working upward through the second compartment. Each succeeding compartment is piped in the same manner. Water is thus introduced into each compartment with an upward motion and must travel a distance theoretically equal to twice the depth of the compartment. Arrangements were made so that the water could leave the mixing device from any of the compartments, commencing with the fourth. This provided flexibility in operation and allowed the mixing period to be varied in accordance with the water being treated. The water from the mixing chamber entered a stilling chamber, after which it was introduced into the first bay of the coagulating basin, which was divided into four bays by three round-the-

end baffles. These baffles were set to produce theoretical velocities as follows:

First bay.....	1.165 ft. per minute
Second bay.....	1.035 ft. per minute
Third bay.....	0.778 ft. per minute
Fourth bay.....	0.445 ft. per minute

With this arrangement, it was hoped to effect a more even distribution of the sludge (Figures IV, V and VI).

Water was taken from the last bay by a 700-gal. per-min. Allis-Chalmers 750 r.p.m. centrifugal pump. The pumping of the coagulated water was made necessary to adjust new work to old, and on account of the topography and character of the soil. The filters were of concrete with perforated pipe collecting system. Each was of  $\frac{1}{2}$  million gal. per day capacity.

Water from the filter was discharged into the clear water basin through a 10-in. cast iron line. This clear well is the other half of the original plain sedimentation basin. The clear water well has been baffled with three transverse round-the-end baffles to secure, as nearly as possible, complete displacement and prevent dead water. The suction line of the high duty pump is at the opposite end of the basin from the filter effluent pipe. The chlorine is introduced into the suction pipe of the high duty pump.

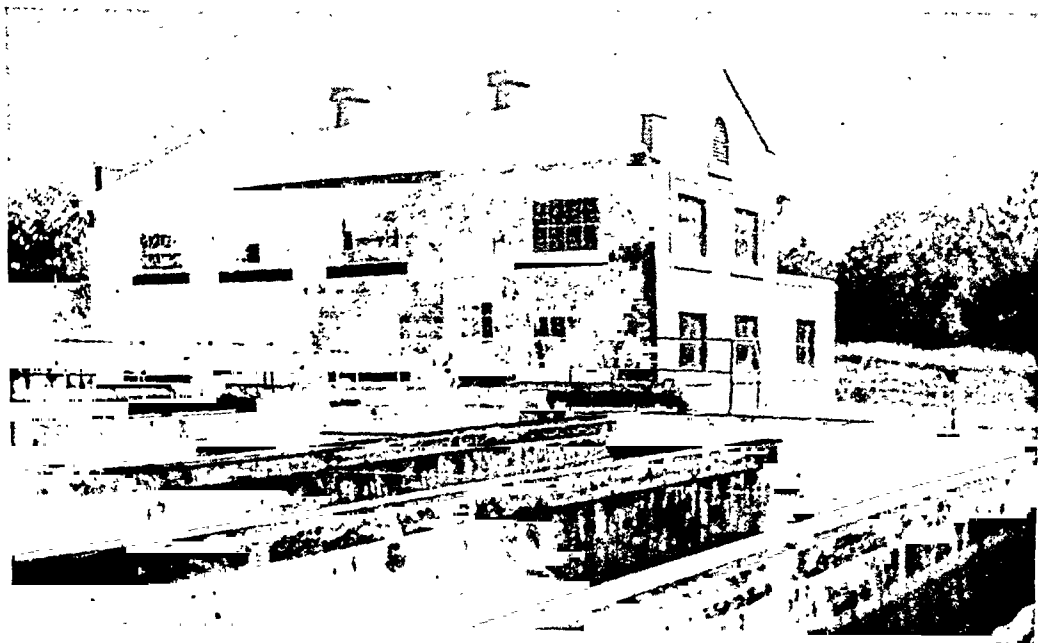


FIGURE V—Coagulating Basin and Filter Building

We would emphasize the fact that complete oxidation of the copperas is absolutely essential to the success of this method of coagulation and that a small excess of chlorine is desirable. An efficient mixing device for chlorinating the copperas should be provided. Substantially complete color removal can be accomplished on waters of the character of that being treated at the plant described, using 0.7 gr. per gal. of chlorinated-copperas. Correction can be made with lime to adjust the pH up to 7.2 without materially impairing the color. Increasing the pH value above 7.2 intensifies the residual color.

The process is efficient and economical without being unduly tedious. Continuously satisfactory results have been obtained during the 6 months that the plant has been in operation. The saving in cost of chemicals as compared with that of other processes tried was found to be very substantial—in our case amounting roughly to \$10.00 per million gallons.

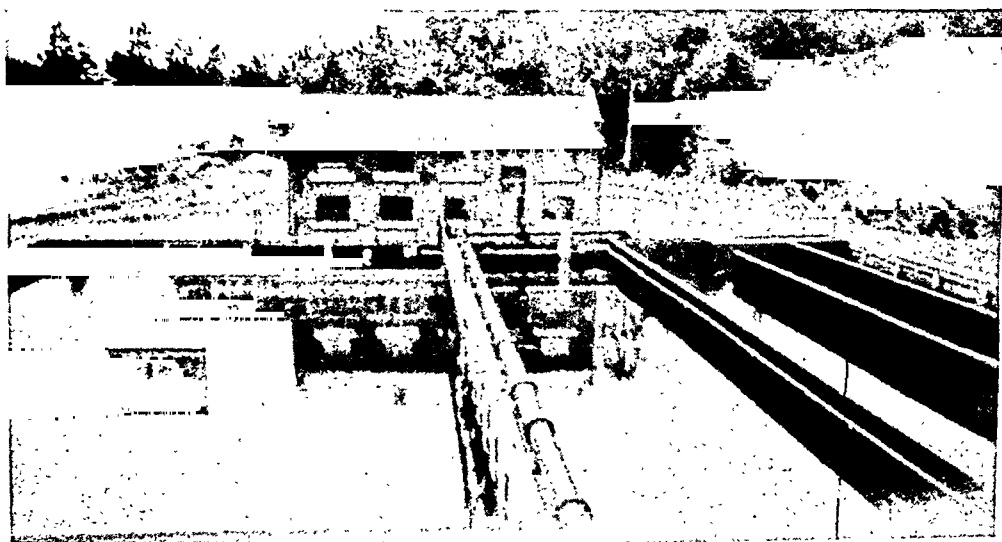


FIGURE VI—Coagulating Basin, Clear Well and Filter Building

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# A Survey Schedule for Industrial Hygiene

THE Committee on Administrative Practice, from the beginning of its work, felt the need of including within the scope and detail of its local surveys information with respect to the industrial health service of communities. Some time ago a committee was appointed by the Chairman of the Committee on Administrative Practice, consisting of W. S. Rankin, M.D., Chairman, Prof. Leonard Greenburg, Secretary, V. S. Cheney, M.D., E. R. Hayhurst, M.D., A. J. Lanza, M.D., E. M. Price, F. L. Rector, M.D., W. A. Sawyer, M.D., and L. A. Shoudy, M.D. This committee was asked to recommend supplemental information to that called for on the regular survey schedule of the Committee on Administrative Practice, so that sound advice as to the industrial health services of communities might be provided for.

It was clearly understood that the sub-committee would not attempt to set up a system for evaluating or appraising the industrial hygiene service of a city, but would limit its work to the preparation of a schedule of information for obtaining additional and special information not included in the regular survey schedule of the committee. With this limitation, the sub-committee did not include much information of interest to those with special interest in the problems of industrial hygiene, because such information as, for example, provisions for the diagnosis and treatment of contagious diseases, venereal diseases, and tuberculosis, and provisions for various clinics, maternal, infant, dental, school, etc., is already provided for in the regular schedule.

## SURVEY SCHEDULE FOR INDUSTRIAL HYGIENE

### 1. Tabulation of Industries

(Include only organizations employing 25 people or more in cities under 50,000 and 50 or more in cities over 50,000.)

LIST INDUSTRIES ACCORDING TO THIS CLASSIFICATION	NUMBER OF EMPLOYEES					
	White		Colored		Total	
	M.	F.	M.	F.		
a. Industrial.....						
b. Commercial .....						
c. Mercantile .....						
d. Public Service .....						
e. Municipal.....						

NOTE: Append list showing name and nature of industries.



2. Health Service Carried on by Industries

Name of Firms	No. of Full-Time Physi-cians	No. of Part-Time Physi-cians	No. of Full-Time Nurses	Physical* Examina-tion on en-trance required	Periodic* Physical Exam. required	Health* Educa-tional Activities carried on	First Aid Facilities

\* Check each column if activity is maintained.

3. Services for Municipal Employees

(Check the following service carried on by the municipality to conserve the health of its own employees.)

Physical examinations	.....
Vaccinations	.....
Medical treatment	.....
Hospitalization	.....
Sick relief	.....
Health instruction	.....

(Append description of outstanding services)

4. Dispensary and Hospital Facilities in City

(This item to be obtained only when hospital survey is not being made)

Name of Institution	Dispensary		No. Hos- pital Beds	Beds per 1,000 Pop.	Per Cent Occu- pancy	No. Hospital Days			
	NUMBER					Free	Part Pay	Full Pay	Total
	Cases	Visits							

5. Occupational Hazards and Diseases

a. Specify any occupational diseases and number of cases reported from this community last year:

Diseases	No. Cases
.....	.....
.....	.....
.....	.....
.....	.....

## 6. Health Supervision of Industries

- a. Does the state health department take any cognizance of industrial hygiene? ..... In what manner? .....
  - b. Does the municipal health department or other municipal agency take any cognizance of industrial hygiene? ..... In what manner? .....
  - c. Does the municipal health department utilize industrial approach in carrying out preventive or educational measures? .....
- If so, how? .....

## 7. Legislation Affecting Health in Industries

- a. What occupational diseases are included in state compensation law? (List) .....
- (Attach copy of law)
- b. Attach copy of laws regulating employment of women and children

NOTE: The above schedule has been approved by the Committee on Administrative Practice of the American Public Health Association for use in collecting additional information to that called for in the *Appraisal Form for City Health Work* (3d ed.), 1929.

## Delta Omega Publication

A 20-page pamphlet giving the list of members of Delta Omega, with their present addresses and their academic degrees, has been issued. This honorary public health society was organized in 1924 at the Johns Hopkins School of Hygiene and Public Health and now has 6 chapters and 250 members.

It is interesting to note that the most popular degree represented among the members of the society is the doctorate of public health (Dr.P.H.), which is held by 69 persons. Twenty of the medical graduates have obtained certificates in public health (C.P.H.) without other public health degrees, while 5 have taken the doctorate of science in hygiene (Sc.D.).

Among the 129 non-medical sanitarians, the doctorate in science has been the most popular, as there are 30 such degrees. Doctors of philosophy are also numerous, 26 being listed, though mostly among faculty members. Fifty-seven of the 250 members are listed as holding only bachelor or master degrees, or certificates in public health. Many of these are, however, candidates for various doctorates, though a considerable number are already actively engaged in public health work.

In tabulating the occupations of the members of the society it is significant that the largest proportion are teachers, though of course many are connected with the faculties of the institutions having chapters. About 30 are with other universities. State health departments claim 24, and local health work only 14, according to the available records. Another 25 are associated with voluntary health agencies. Only 31 of the total of 250 members are listed as being outside of the United States. These figures give an interesting indication of the type of training of present-day sanitarians and their field of activity.

# Effect of Dust on the Lungs\*

JUDGING from the number of investigations carried out during the past few years on the incidence and physiological effects of dust on persons employed in various industries, consideration of the hazard is assuming more and more importance in the minds of those concerned with public health.

The present report deals principally with the incidence of silicosis and does not take into account other health hazards that may be present in the dusty trades.

## OCCURRENCE OF SILICOSIS

This disease, which is distributed in all parts of the world, is found in many industries, such as metal mining, the quarrying and dressing of granite, sandstone, millstone, and flint, the refractory industry, and in sandblasting.

In an investigation into the health and working conditions of employees in the mining industry of Australia carried out in 1928,<sup>1</sup> it was found that silicosis and tuberculosis, either singly or combined, exist as industrial diseases among the employees of the mining industry in Tasmania, as well as in Victoria. Gold mining in Victorian mines is a much more potent cause of industrial pulmonary disease than work in the Tasmanian copper, silver-lead, and tin mines.

Recently in a report on "The Present Position of Silicosis in Britain," *The Lancet*<sup>2</sup> quoted statements by Dr. Middleton, the medical inspector of factories, calling attention to the occurrence of the disease in various industries throughout the country.

According to Dr. Middleton the sandstone industry represents the most widespread of all silicosis producing industries, but the incidence of the disease is diminishing owing to the application of water and mechanical methods of dust suppression. The granite industry, although allied to sandstone quarrying and dressing, is complicated because of the varying proportions of quartz, feldspar, and mica present in the rock. As the result of an inquiry into the slate industry there appears to be some evidence of the production of fibrosis of the lungs, but the occurrence of actual disability within the ordinary working lifetime of workers is not clearly shown.

In the grinding of metals, silicosis, and especially the combined disease of silicosis with tuberculosis, was at one time extremely prevalent, but the sandstone wheel is being largely replaced by wheels of abrasives such as carborundum. Allied to the grinding of metals is the process of sand blasting metals and etching

\* Report of the Committee on Silicosis presented to the Industrial Hygiene Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 4, 1929.

glass, by playing a jet of sand under high pressure against a metal or glass surface to produce certain effects. The process is becoming more extensively used, and it is a matter for serious consideration whether a substitute such as iron or steel grit could not be used to replace the siliceous grit as the abrading material. In pottery manufacture, both in the manufacture of earthenware and of china, Dr. Middleton suggested that "potter's asthma" is due to dust containing ground flint. Ground silica is used in many industries, and, in the crushing and grinding of the silica and in the industries in which ground silica is used, silicosis, sometimes of an acute type, occurs. The evolution of dust in these industries is controlled by the use of mechanical methods of handling, enclosure of machinery, and the use of localized exhaust draught.

Tin mining in Cornwall has had a high mortality rate from tuberculosis, and it has been shown that this is associated with silicosis. Drilling of the highly siliceous rock in which the tin ore occurs is now done through hollow steel with a water feed. Silicosis also occurs in coal miners employed on hard headings.

The report also states that the ganister and silica bricks manufactured in the refractories industry contain over 90 per cent of silica and that a medical board composed of specialists periodically examines each of the 2,000 or 3,000 persons employed in this industry.

According to Stewart<sup>3</sup> in districts of Lancashire County, England, where the industry of coal mining predominates (40 per cent of the occupied males being engaged in mining), the male death rate from pulmonary tuberculosis is higher than the corresponding rate for the whole administrative county. Since the death rate from pulmonary tuberculosis among all coal miners of England and Wales is below that for the general population, the statistical evidence suggests strongly that there is in Lancashire an occupational factor at work that raises the death rate among miners, and that this factor is silicosis.

An inquiry was made by Sutherland and Bryson<sup>4</sup> to obtain evidence regarding the occurrence of silicosis among workers in England manipulating sandstone in connection with the granting of compensation to sandstone workers since February 1, 1929, under the Workmen's Compensation Act of 1925. The findings disclosed that 1 out of every 4 men at work appeared to be the subject of "mason's disease." Since the men were all examined at work, any case so far advanced as third stage, and also many in the second stage, would not be found at work.

In an investigation of health conditions in a sandstone paving stone quarry, which had been in operation near Paris for 50 years, it was found<sup>5</sup> by a study of mortality records that for the period 1881 to 1926 all the deaths occurring among the workers were attributed to respiratory diseases.

In Germany, according to Teleky,<sup>6</sup> in spite of outstanding improvement in conditions, the mortality from tuberculosis is very high among metal polishers—higher than among similar mining groups. He considers sandstone to be the most dangerous grinding stone and recommends the substitution of artificial stone and the introduction of other protective measures such as dust removal, reduction of working time, separate rooms for polishing, and medical supervision.

At the suggestion of the county industrial physician, the Tuberculosis Hospital at Schwetzingen<sup>7</sup> examined 23 of the men engaged in sandblasting in a metal polishing plant after it had been observed that several of the workers were affected by lung diseases. Of the sandblasters examined all except 2 complained of troubles. This report emphasizes the finding that the pneumoconiosis caused by sand dust

is more dangerous than anthracosis. The time of activity of these men in this industry was comparatively short; in most of the cases there was a pronounced roentgenological finding and in some changes of great severity and extent were observed.

An X-ray and clinical examination of 282 workers, who had been employed for 15 years or more in the most dust producing operations of a porcelain factory in the vicinity of Moscow, Russia,<sup>8</sup> showed an unexpectedly low percentage of pneumoconiosis. This was the more surprising as porcelain dust contains large amounts of  $\text{SiO}_2$ . Of the 282 workers examined, 24.1 per cent showed suspicious indications of pneumoconiosis and 13.5 were definitely affected by the disease.

At the meeting of the Permanent International Commission for the Study of Industrial Diseases, which was held in Lyon, France, April 3-6, 1929,<sup>9</sup> Dr. Irvine in his paper, "Diagnosis of Silicosis as an Occupational Disease," gave the following figures regarding the incidence of silicosis among European miners on the Witwatersrand:

During the past 11 years, 4,092 cases of "simple silicosis," 377 "tuberculosis with silicosis," and 365 cases of "simple tuberculosis" have been detected by the Medical Bureau among the working miners on the Witwatersrand. Reduced to average figures these numbers represent in the case of "simple silicosis" alone an annual "production" of 372 cases among a population of 13,436 working miners; so that the average annual rate of incidence for the whole period was 2.76 per cent.

So far, reported studies of silicosis have been made for the most part on industrial groups in which the existence of silicosis as a hazard was deducible *a priori*. In the Industrial Department of the Vanderbilt Clinic, the occasional worker who appeared, giving a history of rock drilling in subway or tunnel construction work in New York City only, and who showed on X-ray examination of his lungs well-marked evidence of silicosis, aroused speculation as to the extent to which silicosis develops under conditions of excavation and tunnel construction in this city.

Of 208 men engaged in occupations exposing them to rockdust in Manhattan, who were selected for complete study, 57 per cent showed the presence of silicosis: 23 per cent showed radiographic evidence of ante-primary silicosis; 19 per cent of first stage silicosis; 7 per cent of second stage silicosis; and 8 per cent of third stage silicosis.<sup>10</sup>

In a study made of the abrasive industry, Clark<sup>11</sup> found that of a total of 137 workers exposed to large doses of dust, mostly from abrasives, over periods varying from 10 to 42 years, 42 showed no silicosis, 12 showed slight silicotic change, 77 the picture of first stage, and 6 the picture of second stage silicosis. Of the 6, 2 had been exposed to large doses of clay dust containing 9 per cent of free silica, 4 had been exposed to abrasive dust only. There were 11 cases in which the X-ray showed an old inactive tuberculosis process in the lung.

#### AGE INCIDENCE AND INFLUENCE OF LENGTH OF EMPLOYMENT IN THE DUSTY TRADES

Inquiry into the age incidence of industrial pulmonary disease among miners examined in Australia<sup>1</sup> shows that, while pulmonary tuberculosis may occur in early life, silicosis is a disease of slow evolution and does not appear frequently under the age of 40, and a period of at least 10 years in the industry is necessary to produce it. However, reports on other industries, such as sandblasting and the

pottery industry, would indicate that under some conditions the disease appears earlier. In the pottery industry in England<sup>12</sup> it has been found that in occupations where the occurrence of silicosis is high the disease becomes evident at an early stage in the occupational history of the worker. Sutherland and Bryson state<sup>4</sup> that where the risk is present in the sandstone industry, the disease is much more common after 40 years of age and after 20 years of work in the industry.

According to Mavrogordato,<sup>13</sup> on the Witwatersrand, among miners who develop silicosis, the mean duration of exposure before the disease is clinically recognized is from 10 to 11 years, whereas in the British pottery industry it appears to be about 25 years. He states, however, that although dust is easier to control in a pottery than in a mine, the potters start work much younger than do the Witwatersrand miners and continue in the occupation much longer. Nevertheless the actual annual silicosis rate of the potters appears to be about the same as that of the miners.

In the sandblasting industry, Müller<sup>7</sup> found more severe pneumocotic lung changes with proportionately shorter activity not only among older workers but also among the younger ones, although X-ray examination revealed more severe changes in the older people than in the younger when the time of activity in the industry was the same. Thus, the average age of the workers, examined by Müller, who had more severe lung changes, was 45 years, while the average age of the other workers was 32.6. The time of activity in the industry was with all comparatively short—with one worker 8 years, with one 6 years, and with all the rest under 3 years.

In the porcelain industry, according to Kaestle,<sup>14</sup> workers hardly ever show characteristic pneumoconiosis under 10 years of work; but in the case of older workers with relatively short working time he found the changes to be clearer and more stubborn than in younger employees of similar working time. He considers that the vitality of the whole man and of the respiratory system plays an essential rôle in the prevention of damage and the self-purification of the intruded dust. He also recommends that only those who have reached a certain bodily maturity be employed in this occupation, since the self-purifying ability of the lungs is greater if the worker is not very young or very old.

In the investigation in New York City<sup>10</sup> it was found that 76 men, or 36.5 per cent, had been exposed less than 10 years, while 132, or 63.5 per cent, had been exposed 10 years or more. The shortest exposure in the entire group was 6 weeks; in the ante-primary group it was 3 years; in the first stage group it was 1 year, and in the second and third stage groups it was 9 years. The longest exposure in the entire group was 46 years. In the ante-primary group it was 40 years; in the first stage group, 46 years, and in the second and third stage groups, 44 years.

According to Hamilton,<sup>15</sup> in the enamel-ware industry, in spite of the improvements that have taken place, it is a significant fact that the working life of an enameler is still short, although his wages are good and his hours often less than the average. One large plant points with pride to a veteran who has worked at the trade for 22 years; another has one with 18 years of service. Since the men start in at 18 or 20 years of age, it is plain that the great majority must give it up before they reach the age of 40 years.

From June, 1927, to December 31, 1928, there were made 15,351 physical examinations of men and 400 of women and children at the U. S. Bureau of Mines Health Clinic, Picher, Okla. This year's work so far indicates that there has been

a reduction in the number of silicotics working in the mines in this district. Much of this reduction is due to the silicotics leaving the mines. A great many of these men have either been given suitable treatment in hospitals, sanatoriums, etc., or have been provided with suitable work outside of the mines.

An investigation, begun in 1926, and reported recently,<sup>16</sup> was made by Hayhurst and his coworkers, in one of the largest and deepest sandstone districts in the world, located in Ohio and worked for more than 50 years. The workmen are employed by two quarry companies which market grindstones, scythestones, curbing, flagging, breakwater and building stone, and also furnace sand. The report summarizes the results as follows:

A stereoscopic X-ray examination was made of each of the 919 workmen, of which number the films of 913 workmen were readable. Of this latter number, pulmonary pathology was found in 55.1 per cent, including 38.5 with silicosis in various stages. The total tuberculosis, however, was but 1.9 per cent. Likewise general disability was low. These findings check relatively closely with those of the tuberculosis statistics for the community. The period for developing silicosis, namely, 16.24 years, is over twice that reported elsewhere. The rock has an average content of from 92.15 to 97 per cent crystalline silica ( $\text{SiO}_2$ ).

A study of silicosis reports throughout the world indicates that tuberculosis is usually present in from 20 to 30 per cent or more of the cases of silicosis, but of our 260 men with silicosis only 13, or 5 per cent, had tuberculosis.

The authors suggest that other silicosis studies at this quarry should include a careful analysis of the rock itself, from both chemical and petrographic points of view.

A few years ago, the U. S. Public Health Service<sup>17</sup> began a series of intensive studies on the health of workers in dusty trades. The first study was reported in 1928, and dealt with the health of workers in a cement plant. The report on the second study,<sup>18</sup> dealing with the health of workers exposed to silica dust in the granite-cutting industry, has recently been published.

This report brings out clearly the extent of the hazard under such conditions as existed in the plants studied. Of particular importance is the fact that it was possible, by differentiating occupations on the basis of the amount of dust exposure, to determine within broad limits how much dust of the composition studied can be tolerated by workers without serious deleterious effects. The conclusion was reached that a maximum of dust exposure falling somewhere between 10 and 20 million particles per cu. ft. of air is a desirable limit for dust containing about 35 per cent free silica in the form of quartz. It was also concluded, on the basis of a study made in other plants having local exhaust ventilation systems, that this limit could be reached by the use of economically practicable ventilating devices of this character. The recommendation was made that occupational processes in which little dust is produced be segregated in separate rooms or buildings.

It should be pointed out that the limit established was not found to prevent the occurrence of silicosis. It was found, however, that there seemed to be no particular liability to pulmonary tuberculosis where the concentration of dust was within this limit.

The study was of such a character as to present a rather definite picture of what happens to men working for many years under a dust hazard of the extent described. The salient points may be summarized as follows:

1. The long period of service before the liability to tuberculosis becomes manifest (generally 20 years or more)
2. The sharp correlation between length of exposure to the dust and the prevalence of tuberculosis and also the death rate from this disease
3. The close relation between the extent of dust exposure and the health of the men
4. The universal occurrence of silicosis among the workers
5. The large proportion of workers finally succumbing to tuberculosis
6. The almost invariably fatal form of the disease within a short time after the onset
7. The different character of silicosis as manifested by X-rays compared with that shown where there is exposure to a dust with a much higher content of free silica
8. The location of the tuberculosis lesion, usually basal, where the disease complicates silicosis
9. The absence of deaths from silicosis *per se*, tuberculosis apparently always intervening
10. The failure of workers to recover from their condition upon going into non-dusty trades
11. The high incidence of sickness of a severe nature from causes other than tuberculosis
12. The rising sickness and mortality rates from tuberculosis due to longer use of the hand-pneumatic tool
13. The high death rates at the present time from tuberculosis, compared with normal industrial experience

#### ETIOLOGY OF SILICOSIS

Miners who have silicosis, according to Tattersall,<sup>2</sup> will be found without exception to have been engaged principally in drilling or hewing stone. The abnormal appearances in the lungs of the gold miner, the stone mason, the quarryman, and the coal miner are similar although the constituents of the dust may vary, indicating that the silica and that alone gives rise to the pathological condition.

According to a paper by Heffernan<sup>3</sup> on the biophysics of silica and the etiology of silicosis, the disease is the result of the local action of hydrated silica upon the pulmonary tissue; this action is physico-chemical in nature and its development depends upon the rapidity with which fresh silica hydrosol is brought into contact with pulmonary tissues; substances, such as alkalis, which favor the formation of silica hydrosol from silica, when added to silica dust accelerate the development of the silicosis; and substances, such as carbon, coal dust or clays, which retard or prevent the formation of hydrosol from silica or which coagulate the hydrosol when formed, retard or prevent silicosis.

In Australia some evidence was noted that silicosis complicated by tuberculosis may occur earlier than uncomplicated silicosis.

Stewart<sup>4</sup> calls attention to the fact that the precise manner in which the silica acts upon the lung tissue and renders that soil favorable for the development of tuberculosis is still a matter of controversy. one view being that the silica acts as a soluble protoplasmic poison, the other view being that colloidal silica is formed which acts in an adsorbent way on the protoplasm of the cells containing the silica, forming a pabulum which is a favorable soil for the growth of tubercle bacilli.



Stewart considers that there is no doubt that when silicosis and tuberculosis are both present, tubercle bacilli are often extremely difficult to obtain; that such a case may proceed to a fatal termination without tubercle bacilli being found, and yet extensive tuberculosis be found post-mortem in addition to the silicosis. According to him, the question of the infectivity of these combined cases of tuberculosis and silicosis is an interesting one. There is a good deal of evidence available pointing to low infectivity as compared with cases of simple pulmonary tuberculosis. The evidence in his own dispensary area (southeast Lancashire) tends to confirm this view, as the number of positive contacts from such cases has been few compared with contacts from patients with simple pulmonary tuberculosis.

Stewart also called attention to the point of controversy as to the priority of the two conditions, whether the silicosis is antecedent to the tuberculosis or *vice versa*. Dr. Watkins-Pitchford in South Africa thinks that the great majority of cases of simple silicosis would not have developed into such but for the presence of a tuberculous element in the lungs. According to Stewart, clinical evidence neither proves nor disproves this view.

In France a histochemical study was made of lungs taken from subjects having lived in the city and never having worked in coal mines<sup>29</sup> and in another study by the same investigators<sup>30</sup> a cytological and histochemical examination was made of the lungs showing 4 typical cases of anthracosis in miners in Courriere. According to these investigators these studies have enabled them to contribute some new results in regard to the much discussed problem of the nature of anthracosis pigment, whether the ferruginous pigment found is derived from blood or from masses of exogenous particles of coal introduced by respiration.

From these studies the following conclusions were drawn: A small part of the pigment encountered in the anthracosis of miners is certainly formed by a substance derived from hemoglobin, yielding red ashes of iron oxide. The other part, by far the more important, is formed by a pigment which disappears by incineration without leaving any residue of iron oxide. This pigment, which is extremely abundant, can be considered either as a non-ferruginous endogenous pigment or as from coal. The authors think that the latter interpretation is correct for the two following reasons: The particles of this pigment are extremely irregular and non-spherical, as those of an endogenous pigment. They coexist always with other particles of a mineral nature, which on incineration leave an abundant residue of calcarious and silicious ashes. This constant existence of silicious minerals and black pigment indicates that this latter is coal. The coal dust is fixed in the lungs exactly as the silicious dust.

According to Mavrogordato, pigmentation facilitates the tracking of dust by the naked eye, but is not an essential part of the changes produced by dust of free silica. If silica particles be injected intravenously, some pigmentation is to be observed on intracellular particles and this pigment is probably a hemoglobin derivative. He considers the point to be rather of interest than importance, as far as silica itself is concerned, and calls attention to the fact that Virchow, until Zenker convinced him to the contrary, regarded pigmentation in dust-phthisis as due to a breakdown of hemoglobin, and not to the dust inhaled. When one turns to the metallic dusts—cobalt, iron or vermilion, for instance—one is reminded of the work of Mallory and others on hemochromatosis and feels that, in these cases, the part played by the breakdown of hemoglobin may be more significant. The presence of carbon in the air does not appear to effect the changes produced by silica other than by coloring them, and the tissue changes, detailed above, according to

Mavrogordato, can be produced by silica alone, and a silicotic lung need show very little pigmentation.

Mavrogordato summarizes<sup>33</sup> the current views on the etiology of silicosis under two headings: 1. Cases of uncomplicated silicosis, in which no infective element is present; and 2. Cases of silicosis complicated by infective processes, of which the most common is tuberculosis. He asserts that certain industries are "phthisis producing" and defines such a dust under four headings as follows: (a) Its nature, (b) size of particles, (c) faculty of being arrested in the tissues, and (d) concentration of dust, duration of exposure and conditions of exposure.

According to him, a phthisis producing dust arrested in the lungs in sufficient quantity will set up a fibrosis, but will not produce a true "miners' phthisis." The effective occupation of the lungs by a phthisis producing dust facilitates infection by the tubercle bacillus, and may influence the result of infection by certain other organisms. Clinical silicosis and fibrosis in the presence of a phthisis producing dust implies arrest of dust in the lungs. The lungs may, however, be effectively occupied by dust clinically undemonstrable yet capable of influencing an after-coming infection. The disabling and fatal form of miners' phthisis, as now met with on the Witwatersrand, he considers is due to an infection by the tubercle bacillus superimposed upon lungs effectively occupied by a phthisis-producing dust. This event may or may not be preceded by a definite clinical silicosis. Delayed resolution and chronic progressive changes may occur in lungs effectively occupied by a phthisis producing dust after recovery from acute pneumococcal or streptococcal infections.

#### PHYSIOLOGICAL ASPECTS

There is not much new material along the lines of symptoms, diagnosis, treatment and prevention, efforts of investigators apparently having been devoted mostly to the determination of the presence of the disease in various industries.

Irvine<sup>9</sup> stressed the importance of the infective factor in silicosis and emphasized the fact that it is uncommon to find a condition of clinically obvious tuberculosis present at the stage at which silicosis first becomes detectable. The very great majority of cases of silicosis found among working miners, when first detected, are from the clinical standpoint cases of uncomplicated or "simple" silicosis, without evidence of obvious or "overt" tuberculosis. Nevertheless, "simple" silicosis should not be thought of merely as a dust fibrosis, but as being at least in a majority of cases a dust fibrosis which from its beginning as a clinically detectable condition is linked up with an element of latent tuberculous infection. The after-history of these cases is in this respect significant. In the majority of instances silicosis is a progressive disease. The outlook of the individual case is mainly dependent upon whether the infective element remains "bottled up" and inactive, or whether, on the other hand, it becomes active, or a further infection occurs from outside the lung. In some instances advance is rapid; in others, again, the condition may remain stationary practically indefinitely. But, although there are wide individual differences, dependent no doubt in part upon constitutional, nutritional and environmental factors, yet the tendency of the majority of cases to advance is, on the average, singularly uniform, and the culmination of that advance, if it proceed to its terminal stage, is in a form of obvious active tuberculosis in the silicotic lung, although by no means all cases advance to that condition.

There is some disagreement in regard to the suggested treatment by the administration of some non-silicious dust, such as coal dust, that is apparently harmless and will assist in removing the harmful dust from the lungs.

Dr. Middleton states that it would appear that once enough silica has been inhaled to produce the nucleus of fibrosis, the resulting inhalation of coal dust into a lung in which the lymphatic drainage has been disorganized increases the fibrosis and produces disability.

Kaestle considers that even with the conviction that dust and bacilli can be forced into the respiratory organs in various similar ways, the attempt of such inhalation therapy is driving out the devil with Beelzebub, a very problematical healing of tuberculosis purchased by the certainty of dust lungs.

Mavrogordato states that, according to experimental studies, a phthisis producing dust and an infective agent simultaneously present facilitate each other's action in the direction of producing fibrous tissue. No experimental evidence could be secured suggesting that the presence of coal dust in the lungs exercised a protective action against tuberculosis. The simultaneous inhalation of coal dust and silica dust facilitates the exit of silica laden cells from the lungs, but a lung previously invaded by coal dust has no special ability to rid itself of silica. As already mentioned, a lung invaded by silica retains the fine soot from acetylene lamps.

Müller<sup>7</sup> points out the injustice of not recognizing as occupational the diseases of sandblasters, resulting from their employment, as lead poisoning is in the case of lead workers. However, in England this is done under a scheme of the Workmen's Compensation Act of 1925. In February, 1929, a new scheme became effective known as the Sandstone Industry (Silicosis) Scheme.<sup>4</sup> Some of the provisions of the scheme are that a register, supplied by the employer, must be kept by the worker and produced when required by the employer or the Medical Board, on which shall be entered date of commencement of his employment with employer, particulars of any previous employment in the sandstone industry or in any of the occupations mentioned in the First Schedule to this Scheme, and date of medical examination entered by the Medical Officer making the examination. The workman will be liable to forfeit his right to compensation if he fails to furnish true information or carry out other specified duties under this scheme. In case of a workman employed in the industry on or after April 1, 1929, or in case of death, his dependants will be entitled to compensation, if his death or disability is caused by silicosis. The disease must be due to employment in the industry, and will be so considered if the workman has been employed for a period or periods amounting to not less than 5 years, unless the employer or the company proves the contrary.

If the employer fails to carry out any of his duties he will be liable to pay an increased subscription to the Compensation Fund. The Scheme requires the employers to furnish facilities for the periodic medical examination made at the works and not, without the consent in writing of the Medical Board, to engage or to continue to employ in the sandstone industry any workman who has been suspended under the Scheme or who has refused to submit himself to any examination required under the Scheme. If the workman refuses or wilfully neglects to submit himself to any such examination or in any way obstructs the same, or if after having been suspended he without consent in writing of the Medical Board reëngages in the sandstone industry, he will be liable to forfeit his right to compensation.

All investigators agree that efficient methods of removing or allaying dust, ex-

amination of men before beginning work in the dusty trades and periodically thereafter with the elimination of the tuberculous, are of value in the prevention of silicosis. Although the rule holds that once silica invaded always silica occupied, the lungs have considerable powers of ridding themselves of silica laden cells. This is borne out by observations made on South African native miners<sup>39</sup> who, for the most part, work short contracts interspersed with visits to the kraals and it is surprising how comparatively little naked-eye pigmentation there may be in the lungs of a man who had worked several underground contracts and has afforded opportunities for observation owing to his death from an accident immediately on resuming work after an interval.

According to Mavrogordato, this indicates that intermittent, as opposed to continuous, employment is perhaps the most effective single measure against silicosis. He states that the simple silicosis rate among native miners employed on the Witwatersrand is lower than that among white miners, although the native, when at work, is more exposed to dust than is the white miner. His employment, however, is intermittent as compared with the continuous employment of the white man. A study of a small group of natives who had been employed continuously showed about the same simple-silicosis rate as obtained among white miners; in fact, the mean duration of exposure before disease was recognized in the continuously employed native was less than that in the case of the white man.

#### SUMMARY

Consideration of the dust hazard in industry, if judged by the reports appearing during the last year, is assuming more and more importance from the standpoint of public health.

The sandstone industry, according to reports, represents the most widespread of all silicosis producing industries. Investigation of this industry in England in connection with the Workmen's Compensation Act showed that 1 of every 4 men at work appeared to be the subject of "mason's disease." Silicosis is found among the metal polishers, metal miners, sandblasters, potters, and any other workers exposed to dust containing free silica. There is a difference of opinion as to free silica being the only causative factor as in New South Wales silicosis has also been found to be caused by orthoclase basalt, which does not contain free silica.

Silicosis may be classed under two headings: uncomplicated silicosis, in which no infective element is present; and silicosis complicated by infective processes, of which the most common is tuberculosis.

Histochemical and cytological studies made on the lungs of miners showing anthracosis and on those of non-miners indicate that the ferruginous pigment found in the lungs of both miners and non-miners is derived from the blood and not from exogenous substances inhaled by them.

Studies made by the U. S. Public Health Service in the granite industry show the close relation between the extent of dust exposure

and the health of the workers. The occurrence of silicosis is universal among them and a large proportion finally succumbs to tuberculosis, death apparently not taking place from silicosis *per se* without the intervention of tuberculosis. The death rate from tuberculosis is high in this industry when compared with normal industrial experience.

South African investigators think that "simple silicosis" should be considered in a majority of cases as a dust fibrosis linked up, from its beginning as a clinically detectable condition, with an element of latent tuberculosis.

A number of authorities stress the progressive character of silicosis since, although there are wide individual differences dependent no doubt in part upon constitutional, nutritional, and environmental factors, the tendency of the majority of cases to advance is singularly uniform and the culmination, if it proceeds to its terminal stage, is in the form of obvious active tuberculosis in the silicotic lung.

There is a difference of opinion in regard to the suggested treatment by the administration of a non-silicious dust, such as coal dust. Middleton thinks that once enough silica has been inhaled to produce the nucleus of fibrosis, the resulting inhalation of coal dust into a lung in which the lymphatic drainage has been disorganized increases the fibrosis and produces disability. Mavrogordato has been unable to secure experimental evidence indicating that the presence of coal dust in the lungs exercises a protective action against tuberculosis but thinks that the simultaneous inhalation of coal dust and silica facilitates the exit of silica laden cells from the lungs, although a lung previously invaded by coal dust has no especial ability to rid itself of silica.

All investigators agree that efficient methods of removing or allaying dust, examination of men before beginning work in the dusty trades and periodically thereafter with the elimination of the tuberculous, are of value in the prevention of silicosis. Although the rule holds that once silica invaded always silica occupied, the lungs have considerable powers of ridding themselves of silica laden cells. According to Mavrogordato this is borne out by observations made on South African native miners who, for the most part, work short contracts interspersed with visits to the kraals and he was surprised how comparatively little naked-eye pigmentation might be in the lungs of a man who had worked several underground contracts and had afforded opportunities for observation owing to his death from an accident immediately on resuming work after an interval.

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Camp on Lake Worth, Texas

# Organization of Local Health Area Statistics in New York City\*

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IN a great city like New York, with a population of 6 million swollen to more than 8 during the day by workers and visitors, and spread over an area of 309 square miles, in what direction and among whom is public health work going to be directed economically and effectively? Where are new hospitals needed, new health centers or clinics to be established?

For the systematic and continuous consideration of local health needs, the Department of Health, the Welfare Council, the Milbank Memorial Fund, and the New York Tuberculosis and Health Association have coöperated in developing a plan for the organization of local health area statistics in 270 districts throughout New York City.

Not only New York but all large cities are badly in need of neighborhood health data; general death rates are too often only theoretical mid-points not representative of many sections. Special studies in Bellevue-Yorkville<sup>1</sup> disclosed that in certain sections the death rate, standardized for age and sex, and based upon data for a 5-year period, varied from 12.3 per 1,000 to 24.2 when the district rate averaged 17.0, and that of the entire city was only 12.5. Without definite knowledge as to where "the dark areas" are, public or private health work is too frequently a wasteful barrage instead of a direct, economic and successful attack. Clearly defined health area units must be recognized in large cities; and standard, comparable vital statistics should be continuously available for each. The steps taken to secure this for New York City are the subject of this address.

## HISTORICAL

For years, there had been available certain population data and very limited mortality statistics by wards or by political boundaries.

\* Abstract from paper read before the Vital Statistics Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 3, 1929.

As time went on these units became most unequal in population; thus, in 1920 the Second Ward in Manhattan showed a census of only 372 and the Twelfth Ward of 951,904. Federal or state censuses naturally publish their returns along frequently changed political boundaries. It therefore became practically impossible to maintain useful local vital statistics along these lines.

In 1906 the U. S. Bureau of the Census greatly assisted in making possible a remedy for the situation. The federal authorities adopted the plan of the New York Federation of Churches "for a scientific permanent basis for neighborhood tabulation of the population of New York City." Enumeration districts<sup>4</sup>—approximately 40 acres each in the populous sections, and multiples thereof in neighborhoods sparsely settled—were laid out and have been followed for each of the last two federal censuses. Since 1910, thanks to the special tabulations by the Population Research Bureau of the Federation of Churches, and its successor the Cities Census Committee,<sup>5</sup> all the usual population data have been made available for these units. In 1914 the Department of Health recognized the census tracts as "sanitary areas" to be followed in constructing new administrative districts in tuberculosis clinic work, baby health station districts, etc.

But even with this progress, certain difficulties and needs remained as regards neighborhood health data: (a) The population in the uniform 40-acre tracts had been found to vary widely, and at times to be quite insufficient for a statistical basis. (b) To code and tabulate data for only Manhattan was found an arduous task when each of the 224 sanitary areas of the 1910 map were recognized. (c) In Greater New York, the 1920 census map recognized no less than 3,427 areas. To attempt the segregation and tabulation of the vital statistics for each of these tracts—not to mention the cost of publishing the tables occasionally, if not currently—was practically impossible. (d) There was also a realization that the ordinary mortality statistics before being utilized and compared should be qualified by sex and age. (e) Finally, there has been the migration from Manhattan to the other boroughs.

The need of adequate vital statistics by neighborhoods in New York, yet gathered along practical lines that could be kept up and currently published, led to the creation in 1927 by the Welfare Council of a committee to consider the problems involved in "Local Statistics required for District Health Work."\* The report adopted<sup>6</sup> covered several essentials; it indicated that "Four basic types of information

\* The Committee appointed by Dr. Haven Emerson consisted of *Chairman*, Godias J. Drolet, Shirley W. Wynne, M.D., Thomas J. Riley, Ph.D., and Jane M. Hoey.



should be available: population, health data, volume of local health work, and cost of local health work."

The most practical service rendered by the committee was in securing an agreement on what should constitute a "Health Area Unit." The report stated that "The geographic unit for statistics of local health work in New York should consist of a group of sanitary areas† aggregating approximately 25,000 population"; and "A reconsideration of the geographic units should take place every 10 years after the local results of the federal census are available." Thereby two achievements were realized: first, an opportunity to meet inequalities of growth and to continue the preparation of local facts on a somewhat comparable basis; and second, the recognition by official and private health authorities of a workable number of health areas, 270 for Greater New York.

Of these health areas, built up by combining the smaller and too numerous sanitary areas, Brooklyn, with its population of 2,300,000, has 92; the Borough of the Bronx, with 950,000 population, 48; Queens, with 850,000 people, 39; Staten Island, with 150,000, 10. For the older Borough of Manhattan, with 1,750,000 population, where for years there had been a careful tabulation of all the essential vital statistics for each of 224 sanitary areas, it was decided to maintain the continuity of the data, but to publish them in comparable aggregates as in the other boroughs for 81 health areas only. In each borough, one health area was set aside for parks and cemeteries.

The Welfare Council report recognizing that knowledge of the local population was also required for district work recommended not only an irreducible minimum of items in each unit, consisting of sex, color, nativity, and of seven age groups, but also pointed out that data on occupation and civil status should also be had, and that "health and social agencies . . . should indicate to the state and federal authorities the importance of a census every 5 years in a center changing so fast as New York." Another significant recommendation was that "Enumerations should be taken not only of the night or home population of the various units in the city, but also, at least in Manhattan, of the day-working population—frequently more permanent in its place of employment than in its home."

As practically all of the recommendations of the report concerning local health data have been carried out by the New York City Department of Health, the mortality items covered and the methods followed will be taken up with the description of the actual work now under way.

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† One of the smaller 40-acre census tracts, previously referred to and totalling 3,427 for all of New York City.

For each health unit comparable information on births, the more common infectious diseases, and leading causes of mortality was requested, with the recommendation that it be currently published for each area corrected on the basis of residence and not of occurrence, even for accidents.

#### ORGANIZATION OF HEALTH DATA

In 1928, both Health Commissioner Louis I. Harris, M.D., and his successor Shirley W. Wynne, M.D., approved the plan recommended. Pending municipal support, the Milbank Memorial Fund and the Welfare Council contributed together \$5,000 for clerical assistance to "initiate the compilation of local health statistics."

The next practical step taken was that of the Bureau of Records which prepared an original street index to permit proper assignment of the certificates and reports to be classified.

Certain important definitions in classifying by area of residence have had to be kept in mind. Fortunately for almost twenty years deaths in institutions have, in every case possible, been charged back to the borough of residence of the deceased. In a great city like New York there are also deaths of "unknown" persons or homeless and lodging house men, and of "non-residents" numbering more than 2,000 annually. The numbers of these in each area have naturally had to be stated separately from those for residents only.

The lesser section of local health area statistics in New York is that devoted to communicable diseases. Only ten of the more common conditions registered were recommended for inclusion: tuberculosis, diphtheria, measles, scarlet fever, whooping cough, typhoid fever, influenza, pneumonia, syphilis and gonorrhea, separately for males and females. Let us recall that the usual and complete lists of the reportable diseases and the full standard mortality data are being kept up for the entire city, and for each borough as well.

The task of performing properly the local segregation can be realized when it is seen that this will involve annually the additional coding and handling of at least 125,000 birth certificates and 75,000 deaths, beside the distribution of another 75,000 to 80,000 reports of infectious diseases.

The actual work of classifying local health data throughout the city was started at the beginning of 1929 and several abridged preliminary reports have already been published. The practical aspects of this new service to the community can be better understood by studying the items contained in a work sheet for a single district: First, in each area are the births according to residence of mothers,

separately for white and colored. Second, the mortality data are classified both by sex and color within each of seven age groups: under 1 year, 1 to 4 years inclusive, 5 to 14, 15 to 24, 25 to 44, 45 to 64, 65 and over.

With the comparatively small population included in the areas selected, around 25,000, it was considered essential to have not only the total number of deaths from certain causes, but also qualification of these by sex, color, and at least the more important age groups so as to permit even the standardization of the death rates and to allow thereby for the greater variation in age or sex composition likely to be found in smaller "communities."

In the complete original health area tabulations made in the Bureau of Records, the deaths are also classified separately within each of the following causes or groups of diseases: typhoid, measles, scarlet fever, whooping cough, diphtheria, influenza, poliomyelitis, encephalitis, epidemic cerebrospinal meningitis, pulmonary tuberculosis, other tuberculous diseases, cancer, diabetes, cerebral hemorrhage, heart diseases, arterial diseases, broncho-pneumonia, lobar pneumonia, diarrhea under 2, and over, appendicitis, chronic nephritis, puerperal septicemia, other puerperal causes, congenital debility and diseases of early infancy, suicide, accidents by automobiles, and by other causes, first, by place of occurrence and, second, by place of residence, homicide, other causes, total deaths charged to area, deaths of non-residents and deaths of area residents only.

Accidents, after being charged to place of occurrence, are redistributed to area of residence. This enables one to know also the full mortality, natural and accidental, of all residents of an area. The ordinary method of charging accidents to place of occurrence only, Drolet believes, may, in default of knowledge of the added working or visiting population during the day in business areas, mislead and vitiate the accuracy of the general death rate wanted for residents only.

#### PUBLICATION

The full tabulation of the reports of the principal communicable diseases and of leading causes of mortality, classified according to sex, color, and important age groups in each of 270 health areas in New York City, has already been completed for most of 1929, and practical use of it has been made by several health agencies.

The problem, however, of printing such detailed information currently and within reasonable cost has been only partially solved thus far. The original recommendation was for a quarterly bulletin, but Department of Health officials, concerned with sanitary supervision,

have pointed out that in the case of communicable diseases it would be more useful to have the bulletins issued at least monthly. The original 270 area records of mortality for the whole city with seven age classifications and a total for each area require 2,160 horizontal lines alone. And the 35 causes of death or groups of data, subdivided into sex and color, amount to 140 vertical columns.

Accordingly, while the complete tabulations, as described, are being kept up in the Bureau of Records, and access is readily granted to recognized agencies and institutions, it is now planned to publish complete tables only annually. However, in the meanwhile, an abridged issue is being published monthly. Economy has been secured by including only the totals, without age classification, but by color for births, deaths under 1 year, and 16 causes of mortality.

#### USE OF THE HEALTH AREA STATISTICS

Current use of the local reports of births, deaths, and of registration of infectious diseases is already being made by the Bellevue-Yorkville Health Demonstration. By aggregating the returns of the eight health areas in their district, the director of that interesting public health experiment is enabled to send each month to members of the local community health services and participating agencies not only a report on current administrative activities but also the latest information on prevailing contagion, as well as the returns of births and various causes of mortality. The opportunity to test the progress of local public health measures is immediate and there is a guide upon which to base programs in relation to actual needs.

At the East Harlem Health Center, and in the Bowling Green Neighborhood, similar mortality information for the smaller sanitary areas only, already available in the past for Manhattan alone, has been used for special studies of local health conditions.

The latest use of the local health area statistics is that recently inaugurated through Health Commissioner Wynne for a preliminary survey of health center work in New York. With the recent and great shifts of population in the various boroughs the question of locating properly, and where most needed, additional baby health stations, various clinics and new health centers is a constant one—in fact, after the establishment of important central services by the Department of Health the decentralization of certain public health activities is now urgent.

How to undertake neighborhood health work best; how to get near to and reach all sections of the people in a great community—for instance of 1,250,000 school children—is not easily answered. To per-

mit an intelligent consideration of basic facts and needs the Committee on Neighborhood Health Development is first utilizing the health area map, and in each of these units are being spotted existing hospitals, clinics, and schools; after this, are added the latest population figures for each health area, the school registration, and for the first half of 1929, the births, deaths, and cases of infectious diseases. With these data of possible local requirements for maternal and infant welfare work, school medical service, amount of required home sanitary supervision, local mortality rates, and finally of existing institutional facilities or knowledge of their absence, it will be a much more direct process to visualize health needs in every part of the city.

In conclusion, the authors remark that the majority of the American people now live in cities, many of them large; that the ordinary average vital statistics report for an entire community is insufficient to portray the diversified life in the urban centers; that the dependence for segregation upon ordinary political subdivisions is inadequate; that the use of reports of mortality within small units demands care in meeting differences of sex, age, or color; and, therefore, that we point out the practical experiment inaugurated for the current compilation and publication of local health area statistics along standard lines in each of 270 districts throughout New York City.

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# Vitamin Content of Ethylene-treated and Untreated Tomatoes\*

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THE use of ethylene gas for the forced coloration of certain fruits and vegetables, such as citrus fruits, bananas, and tomatoes, has recently attracted much attention from both the commercial and the nutritional standpoints. By this process the development of color characteristic of the ripe fruit can be materially hastened in green, unripe fruit either before or after shipment; and the period during which the fruit can be stored, or shipped from warm to colder regions in advance of the local season, lengthened. It also results in products more uniformly colored, having a firmer texture, and less subject to injury from handling, than those allowed to ripen naturally before being gathered. Ethylene has also been found efficacious in removing the astringency of certain fruits, such as persimmons, due to the presence of tannins.

It has been long known that the coloring or ripening of certain fruits can be hastened by placing the fruit in closed rooms or tents in which oil or almost any other fuel is being burned. The effects were at first attributed to increased temperature and humidity. In 1912 Sievers and True,<sup>1</sup> working on the "sweating" process of ripening citrus fruit, discovered that the hastening of the coloring of lemons was caused by the action of gaseous products of incomplete combustion. Following up this work Denny<sup>2</sup> showed that the constituents of these gases that were most effective were unsaturated hydrocarbons, notably ethylene. In 1923 Denny<sup>3</sup> secured a patent covering the use of ethylene for the forced coloration of fruit. Chace and Denny in 1924<sup>4</sup> contributed additional data on this process.

The blanching effect of ethylene and other constituents of illuminating gas on plants had been early observed by Kroker and Knight,<sup>5</sup> Schonnard,<sup>6</sup> and others. Other contributions on the application of ethylene to the coloration of fruits and the blanching of celery have been made by Chace and Church,<sup>7</sup> Rosa,<sup>8</sup> and Harvey.<sup>9</sup>

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Soon after the announcement of the ethylene process for treating fruits and vegetables, the *Journal of the American Medical Association*, recognizing the possible harmful effect upon their nutritive value that might result from chemical treatment of foods, particularly with reference to the vitamins, called attention<sup>10</sup> to the need of work to develop information regarding the effect, if any, of the ethylene process on vitamins.

In view of the work that had been done in the U. S. Department of Agriculture on the study and development of the ethylene treatment of fruit, and in conjunction with a continuation of investigation on this subject by the Food Research Division of the Bureau of Chemistry and Soils, we undertook a study of the comparative vitamin value of tomatoes treated and untreated with ethylene gas, and collected at different stages of development.

#### PREPARATION OF THE MATERIAL\*

The tomatoes used were a pure bred strain grown specially for the ethylene studies on the U. S. Department of Agriculture experiment farm at Arlington, Va.

They were collected at three stages of development, immediately washed with water, and handled as follows: Green tomatoes in two stages of maturity were divided into four lots. The lots to be treated with ethylene were placed in earthen jars; ethylene gas was introduced in the proportion of 1 part in 1,000; and the lids were sealed.

The tomatoes were removed from the jars daily, dried and aired, then replaced; fresh ethylene gas was introduced, and the jars were resealed. After treatment with the gas for 5 days, they were ground in a meat grinder, thoroughly mixed, heated in a steam bath, and placed in cans while hot, sealed and processed according to usual cannery practice.

The portions untreated with gas were ground as soon as picked, processed and canned in the manner and under conditions identical with those described for the gas treated tomatoes.

In addition to the green tomatoes referred to, others that had been allowed to ripen naturally on the vines were likewise canned.

There were thus prepared for the vitamin studies five different lots of tomatoes referred to as follows:

*Lot 1*—Mature, green tomatoes, untreated; i.e., full grown fruit in which the chlorophyl had begun to fade, but which were not ripe

\* We are indebted for the material used in the vitamin studies described in this paper to Dr. F. C. Blank of the Food Research Division of this Bureau, under whose general direction the tomatoes were grown, collected, treated, and canned; also to Dr. L. H. James of the Food Research Division, who personally supervised the work in the preparation of the material.

*Lot 2*—Tomatoes naturally ripened on the vines—untreated

*Lot 3*—Immature, green tomatoes, walnut size, untreated, in which the chlorophyl had not begun to fade

*Lot 4*—Mature, green tomatoes, similar to *Lot 1*, treated with ethylene

*Lot 5*—Immature, green tomatoes, similar to *Lot 3*, treated with ethylene

After being canned, the tomatoes were placed in cold storage.

There were marked differences in the proportion of solid material to juice in the different lots. The cans of mature, ripened tomatoes contained more juice than did the green, immature fruit.

Since tomato juice is used extensively and frequently recommended in infant feeding, and our feeding technic could be greatly facilitated by using the juice, only that portion of the fruit which passed through a fine muslin cloth was used in our vitamin tests.

Owing to the possibility of retention of some of the vitamins in the pulp the results obtained may not represent the full vitamin potency of the tomatoes used. We were interested in comparative rather than absolute values.

The following observations on the canned fruit were noted: *Lot 1* showed the development of a little red color. *Lot 2* was more deeply colored than *Lot 4*, although the latter was well within the range of color of commercially canned tomatoes. *Lot 5* was slightly darker in color than *Lot 3*, the small untreated tomatoes. There was no evidence of any lycopin formation in *Lot 5*. We found a marked difference in the quantity of juice that could be expressed from the crushed fruit, depending upon whether or not the tomatoes had been treated with ethylene and also upon the stage of maturity. The average amount of juice obtained in three separate trials was as follows:

*Lot 1*, 71 per cent

*Lot 2*, 82 per cent

*Lot 3*, 62 per cent

*Lot 4*, 77 per cent

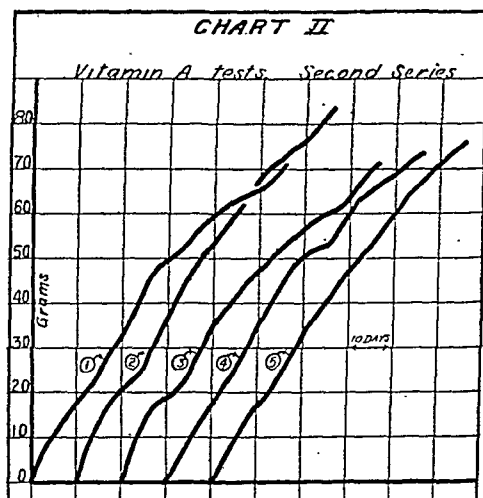
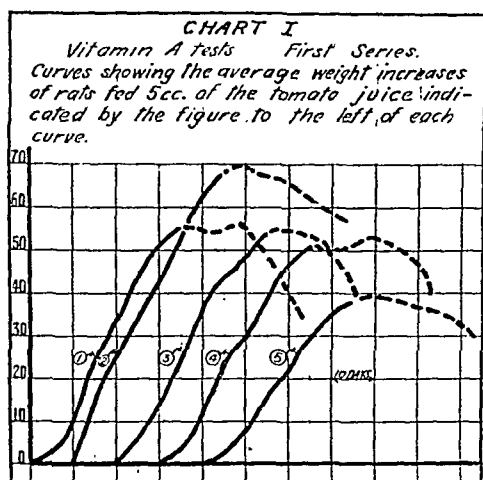
*Lot 5*, 70 per cent

#### VITAMIN A

Curative vitamin A tests were conducted essentially according to our technic as described elsewhere." In the first series four litters of rats showing definite signs of ophthalmia were divided into six groups, each consisting of 2 males and 2 females, 1 animal from each of the four litters. Five groups were fed 5 c.c. of tomato juice daily from each of the five lots of tomatoes as indicated by the figure to the left of each curve in Chart I. The remaining group served as a negative control. The A-deficient diet consisted of alcohol extracted casein, 18 per cent; salt mixture (Osborne and Mendel's), 4 per cent; agar, 2 per cent; yeast, 8 per cent; dextrinized starch, 67 per cent; and peanut oil, 1 per cent. Of the yeast used 0.5 per cent had been irradiated, and its vitamin D potency had been determined.



The tomato feeding was discontinued at the end of 5 weeks, and the animals were then kept on the basal diet until they showed considerable loss in weight. As shown in Chart I the rats which received the naturally ripened tomatoes, Lot 2, made distinctly better gains



than those of the other groups. The control rats survived an average of 23 days from the time their litter mates were first fed tomatoes, and all developed severe cases of ophthalmia before death. The other groups all showed improvement of the eyes during the tomato feeding period, but there were no definite cures of ophthalmia. The group receiving tomato juice, Lot 5, did not react differently from the other groups notwithstanding uniformly poorer growth. The sharp breaks in the curves when the tomato juice was withdrawn from the diet shows that the level of tomato fed did not permit storage of vitamin A.

The second series of tests was conducted in the same manner as the first, except that the tomato feeding was carried on for 8 weeks, and the experiment then terminated (Chart II). As in both series of tests the rats receiving Lot 2 tomato juice grew more rapidly than those on any other lot, it is evident that the naturally ripened tomato is the best source of vitamin A. No explanation is offered for the fact that in the first series the rats on Lot 5 did not grow so well as those of the other groups. There was very little individual variation within the group. In the second series the Lot 5 rats showed the largest average gain, with the exception of Lot 2, due to the exceptionally rapid growth of one animal.

At the end of 5 weeks the following average gains had been made in each of the ten groups:

	Lot 1	Lot 2	Lot 3	Lot 4	Lot 5
First Test	55	68	54	51	38
Second Test	54	60	52	53	53

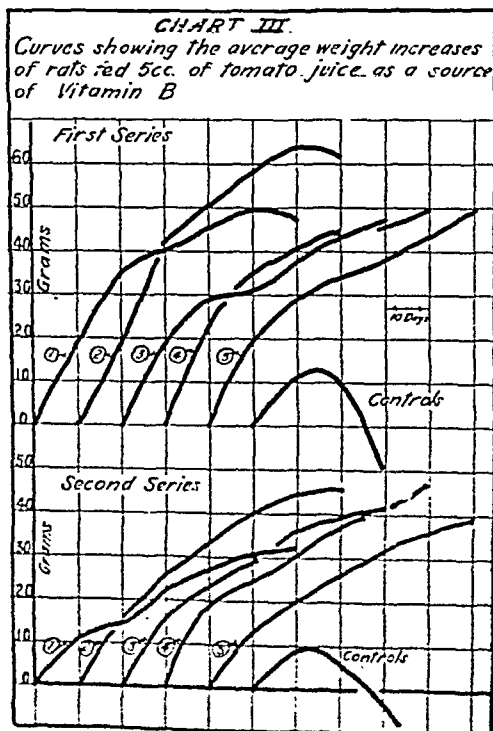
## VITAMIN B

In the vitamin B tests the following diet was used: Alcohol extracted casein, 18 per cent; salt mixture, 4 per cent; agar, 2 per cent; cod liver oil, 2 per cent; autoclaved yeast, 5 per cent; and dextrin, 69 per cent. The yeast was autoclaved 4 hours at 15 lb. pressure, and previous tests had shown it to be free from the antineuritic vitamin. The casein was similar to that used in the vitamin A tests just described.

In the first series of tests four litters of rats weighing about 60 gm. each were divided into six groups comparable as to size, sex, and parentage. One group received only the basal diet while the others received 5 c.c. per day of the different lots of tomatoes for a period of 60 days. Each curve for the first series seen in the upper portion of the chart shows the average weight increase of 4 rats, 2 males and 2 females. As shown on Chart III the fully ripened tomatoes, Lot 2, were distinctly superior as a source of vitamin B to the other lots, which were all about the same.

Each curve of the second series, begun nearly 3 months later, represents the average weight of 4 male rats. Not more than one animal from one litter was used in a group. In no case did the rats in the second series grow as rapidly as those in the first and there was not the same degree of response in comparable groups. The average gain for all the males in the first series (2 rats in each group) was 53 gm. The average gain in weight for all rats in the second series (all males) was 41 gm. Evidently a marked loss of vitamin B occurred in the canned tomatoes during the period intervening between the two series of tests.

The average survival of the control rats in the first series was 31 days and the second series 41 days. One of the controls in the



first series died at the end of 20 days, about 10 days less than the minimum survival period usually observed.

#### VITAMIN C

As in the vitamin A and B tests, the vitamin C assays were conducted on two sets of animals. In the first series the interpretation of the results is based upon symptoms of scurvy in the living animals and post-mortem examinations. In the second series, data on survival of the animals were also obtained. The two sets of experiments will be discussed separately. Twenty-eight guinea pigs weighing from 280 to 325 gm. were divided into seven equal groups, five of which received 1 c.c. of tomato juice from the different lots of tomatoes. The other two groups were used as controls. One group received 2 c.c. of orange juice daily, and the other served as a negative control. The basal diet consisted of rolled oats, 69 parts; alfalfa, autoclaved 30 minutes, 25 parts; casein, 5 parts; and sodium chloride, 1 part.

At the end of one month only one control animal showed definite symptoms of scurvy, and the other animals were all apparently normal, with the exception of a slow growth rate in many. Evidently our basal diet was not free from vitamin C. Alfalfa which had been autoclaved 90 minutes was then substituted for that which had been autoclaved 30 minutes. In 2 weeks all of the negative controls showed marked symptoms of scurvy, as did the two groups receiving tomatoes, Lots 3 and 5. Three animals in each of the groups receiving tomatoes, Lots 1 and 4, showed distinct signs of scurvy before the experiment was terminated. None of the animals receiving the naturally ripened tomatoes, Lot 2, nor those receiving orange juice showed any signs of scurvy. The only marked difference between these two groups was the more rapid rate of growth of the orange juice fed animals.

At the end of 58 days the animals were killed and post-mortem examinations made. The groups receiving tomato juice, Lots 3 and 5, and the negative controls all showed severe scurvy. Extensive subcutaneous hemorrhages, brittle bones, and frequently loose teeth were the most conspicuous findings. Three animals in each of the groups receiving tomatoes, Lots 1 and 4, showed subcutaneous hemorrhages, while the remaining animal in each group was apparently normal. Those receiving Lot 2 gave no post-mortem evidence of scurvy.

Before starting the second series of tests we demonstrated that the alfalfa we were using contained a considerable quantity of vitamin C and that if it were autoclaved 90 minutes the animals would develop scurvy in about 3 weeks. Consequently, the alfalfa was autoclaved 90 minutes in our later work.

The second series of tests on the tomato juice was conducted on the same number of guinea pigs, all virgin females, weighing from 250 to 297 gm. The levels of tomato and orange juice fed were the same as in the previous series. Because of the differences in vitamin C content of the various lots of tomatoes, we obtained data on the survival of the animals. At the end of 90 days when the experiment was terminated 7 animals were alive, 1 receiving Lot 1 tomato juice, 2 receiving Lot 2, and 4 receiving orange juice.

Table I gives the days of survival of the animals used.

TABLE I

<i>No Vitamin C</i>	<i>Lot 1</i>	<i>Lot 2</i>	<i>Lot 3</i>	<i>Lot 4</i>	<i>Lot 5</i>	<i>Orange Juice</i>
36	61	59	35	51	56	90
40	90	50	35	44	31	90
41	59	90	48	22	34	90
35	51	90	17	46	43	90

With the exception of the guinea pigs receiving orange juice and 2 animals receiving Lot 2 tomato juice, all of the animals showed unmistakable symptoms of scurvy at the end of 3 weeks. One animal on Lot 1 which survived the experimental period was inactive during the last 40 days, and showed complete loss of control of the hind legs. The 2 animals on Lot 2 which survived the experimental period remained active until the end. At times their wrists were sore and swollen, but scurvy symptoms were transient. Post-mortem examinations revealed evidence of scurvy in both of these animals. All animals which died showed severe scurvy upon post-mortem examination. The control animals all made a steady average gain of about 3 gm. per day until the experiment was terminated.

#### DISCUSSION

The most practically significant result is probably the evidence obtained showing that naturally ripened tomatoes are a better source of vitamins A, B, and C than any of the others studied, either treated or untreated with ethylene gas.

No material difference was observed in the vitamin A content of the green tomatoes picked at different stages of development, whether or not treated with ethylene. The same was true of the vitamin B content of the different lots as determined in the first series of tests.

The vitamin C value of tomatoes seems to increase as the fruit develops and approaches the mature ripened condition. Naturally ripened tomatoes contained the most vitamin C, full grown, green tomatoes came next, and the small, immature fruit contained the least of all. The ethylene treatment of the green tomatoes produced no

significant change in their vitamin C potency, which was low in all samples of the green fruit tested. The second series of tests for vitamin B gave lower values than obtained in the first series with samples of the same lots. Apparently a loss of this vitamin occurred on storage, for which we have no explanation.

After the work described was well under way, two articles on this subject appeared. Morgan and Smith<sup>12</sup> found that ripe tomatoes were richer in vitamin A than green tomatoes, but that the amount in ripe tomatoes was about the same, irrespective of the methods used in ripening. House, Nelson, and Haber<sup>13</sup> found that green and ripe tomatoes contained essentially the same amount of vitamin B, irrespective of the methods used in ripening. They also found more vitamin A in ripened than in green tomatoes, but the tomatoes ripened by the different methods had the same amount. Their results on vitamin C are in agreement with ours. Our results cannot be satisfactorily compared with those of House, Nelson, and Haber, because these authors fed the whole tomato, while we fed only the juice. Furthermore, they do not give sufficient details regarding the handling of the tomatoes after having been picked from the vines, and they make no statement regarding the length of time the tomatoes were treated with ethylene.

In so far as the use of tomato juice as a source of vitamins is concerned the results of our work indicate that vine-ripened tomatoes are preferable to those picked green and treated with ethylene gas to develop the color characteristic of ripe fruit. No indication was observed that the ethylene treatment had any deleterious effect upon vitamins already developed.

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# Seasonal Distribution of Typhoid Fever—Southern and Northern States\*

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MANY diseases exhibit a marked seasonal variation in their incidence, a phenomenon of perpetual interest to epidemiologists. Recently some evidence has been brought forward which indicates that this phenomenon may depend to some extent at least upon periodic changes in immunity caused by seasonal variations in the physiological activities of the human body. Aycock<sup>1</sup> has discussed the differences observed in the incidence of poliomyelitis from this point of view and suggests these may depend upon variations in human physiology rather than upon variations in the virus. Experimental studies carried out by Arnold<sup>2,3</sup> on dogs indicated that the secretion of hydrochloric acid by the stomach was diminished when the external temperature was high. This in turn was found to disturb the acid-base equilibrium of the upper part of the small intestine, with the result that the "self-disinfecting" power of the mucous membrane was reduced, as shown by the fact that the duodenum no longer had its usual ability to destroy organisms introduced into it. In this instance also variation in immunity seems to be due to variation in physiological activity. Arnold points out that in view of his experimental studies it would be expected that typhoid fever would be more prevalent in summer than in winter, a deduction which agrees with epidemiological experience. The greater prevalence of typhoid fever in summer may thus be ascribed to the heat associated with that season.

These explanations suggested that it would be of interest to compare the seasonal distribution of the yearly incidence of typhoid fever exhibited by southern states with that by northern states.

Since it had been shown<sup>4</sup> that for measles, diphtheria and scarlet fever the peak of the incidence for each occurs a month or two earlier in the southern than in the northern states, and since the southern part of the United States experiences a high temperature earlier in

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the summer than the northern, it was decided to see whether there was any difference in the time of the maximum occurrence of typhoid fever in these two sections. Time series representing the occurrence of typhoid fever by months over a period of years (1912-1928) for a number of states were studied and for each successive complete seasonal swing or wave of a series the month of maximum incidence was noted. A month of maximum incidence is the month within the limits of one complete seasonal swing or wave for which the maximum number of cases is recorded.

No state was used for which adequate data had not been published in the Annual Summaries of the Notifiable Diseases appearing in *Public Health Reports*. In order to have as much separation in latitude as possible between a group of southern and a group of northern states, Alabama, Arkansas, Florida, Georgia, Louisiana, Mississippi, North Carolina, South Carolina and Tennessee were included in the former, and Connecticut, Maine, Massachusetts, Michigan, Minnesota, Montana, North Dakota, New York and Wisconsin in the latter.

For the former group July, while for the latter group September, was most frequently the month of maximum incidence. In other words, by the method used, the peak of the incidence of typhoid fever

for the states studied was shown to occur two months earlier in the southern than in the northern group. The frequency distribution of the months of maximum incidence obtained for each group of states is presented in Table I and Figure I.

By this method of analysis only the month of maximum incidence of any individual seasonal wave was considered. Furthermore, the experience of all years was included without regard to whether they were epidemic or non-epidemic in character. In addition to the information which this approach furnished, it was desirable to ascertain the characteristics of a typical seasonal wave derived

TABLE I

FREQUENCY DISTRIBUTION OF THE MONTHS OF  
MAXIMUM INCIDENCE OF TYPHOID FEVER

Month	Southern States	Northern States
Jan.	1	2
Feb.		1
Mar.		3
Apr.	4	1
May	1	3
June	6	2
July	51	4
Aug.	37	26
Sept.	9	66
Oct.	1	27
Nov.	1	8
Dec.	2	2
Total	113	145
Most Frequent Month	July	September
Mean	July 13	August 21

from the data of the southern states and also of one from the data of the northern states. Both of these were needed in order that a comparison might be made as to the distribution of cases by months throughout an entire year. A number of such seasonal waves or curves were obtained by various methods.

To insure that each wave or curve would be based upon a sufficient number of cases to give some degree of stability to the result, the figures representing the monthly incidence were combined. For the nine southern states the total number of cases of typhoid fever during the period 1912-1928 was obtained by simple addition. The total number for each month was obtained in the same way and expressed as a percentage of the grand total. A similar procedure was followed for the nine northern states. The percentage seasonal distribution of cases for each area appears in Table II and Figure II. A comparison of the two curves clearly indicates that typhoid fever reaches its maximum earlier in the south than in the north. Certain objections, however, can be legitimately raised to percentage seasonal distributions of cases thus derived. Data for each year of the entire period of seventeen years were not available for every state; the method assumed that a typical distribution could be obtained by using the arithmetical mean, and the degree to which the result might be affected by the weight of a large state was undetermined.

To deal with these objections and to test the reliability of the derived seasonal curves, a different procedure was tried. A southern combined area was formed which included Alabama, Louisiana and Mississippi; and a northern one which included Connecticut, Michigan, Minnesota, New York and Wisconsin. The composite monthly incidence of typhoid fever for each area was next obtained by adding together for the included states all the figures representing the in-

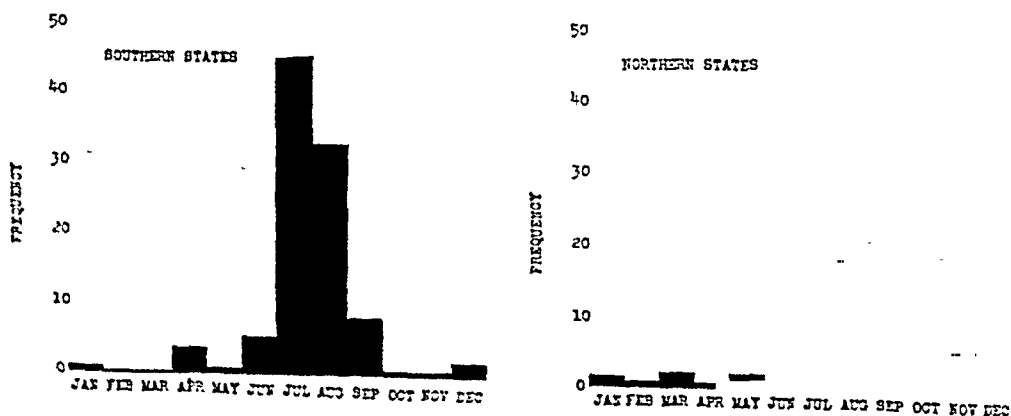


FIGURE I—Typhoid fever. Frequency distribution of 100 months of maximum incidence



cidence of corresponding months. This method of combining numbers of cases and the fact that the composite monthly incidence of the two areas was to be compared by means of averages, as explained below, required that data for each and every state, without regard to the area in which it was included, must be available by months over the same period of time. The limitation to these states and the period 1915-1928 was dictated by this requirement.

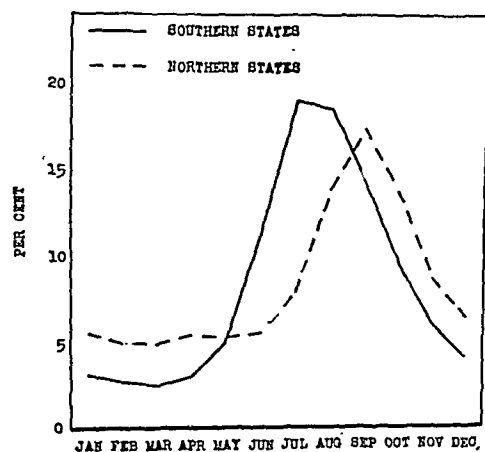


FIGURE II—Percentage seasonal distribution of typhoid fever for a year of mean incidence calculated for the period 1912-1928

TABLE II  
PERCENTAGE SEASONAL DISTRIBUTION OF TYPHOID FEVER FOR A YEAR OF MEAN INCIDENCE CALCULATED FOR THE PERIOD 1912-1928

Month	Nine Combined Southern States	Nine Combined Northern States
Jan.	3.15	5.61
Feb.	2.73	5.00
Mar.	2.46	4.87
Apr.	2.97	5.43
May	5.02	5.26
June	11.37	5.64
July	18.99	7.88
Aug.	18.63	13.70
Sept.	14.64	17.42
Oct.	9.75	13.80
Nov.	6.16	8.78
Dec.	4.15	6.61

The next step was to obtain for each area the incidence of a typical year distributed by months, really a seasonal wave. The experience of any given year, because of the irregularities it might exhibit, was considered unsatisfactory and therefore the incidence of a typical year was calculated from the recorded experience of all the years in the period considered. Two methods of calculating the incidence of a typical year were employed—one based upon the median as an average, a full discussion of which appeared in a recent article,<sup>5</sup> and the other upon the arithmetical mean as an average. The former was carried out as follows: For each combined area the figures representing the incidence of typhoid fever for all the various included Januarys were placed in an array and a central value corresponding approximately to the median was determined by means of a parabolic smoothing, and a similar method used for each of the other months. These twelve monthly median numbers of cases were added together to obtain the total for a year of median incidence. The median incidence of each month was expressed as a percentage of this total, the

twelve resulting percentages being an expression of the seasonal distribution of the cases in a year of median incidence.

In obtaining the incidence of a typical year based upon the arithmetical mean as an average, the mean of each array was calculated instead of the median. The twelve monthly mean numbers of cases were added together and the mean incidence of each month expressed as a percentage of this total.

Table III reveals that both procedures gave approximately the same result. In other words, the arithmetical mean turns out to be a suitable average to use in calculating the incidence of a typical year. Furthermore, a comparison of the seasonal distributions thus derived for the two combined areas (see Table III and Figure III) confirms the observation that the peak of the wave for the northern area occurred two months later than that for the southern area. There is also some slight though inconclusive evidence that the wave for the southern states is less peaked than that of the northern.

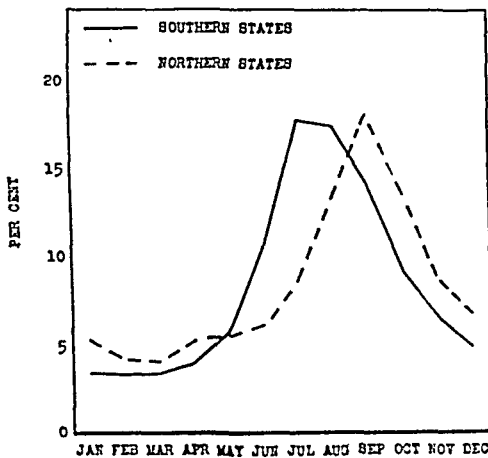


FIGURE III—Percentage seasonal distribution of typhoid fever for a year of median incidence calculated for the period 1915-1928

TABLE III  
PERCENTAGE SEASONAL DISTRIBUTION OF TYPHOID FEVER CALCULATED FOR THE PERIOD 1915-1928

Month	Three Combined Southern States		Five Combined Northern States	
	For a Year of Mean Incidence	For a Year of Median Incidence	For a Year of Mean Incidence	For a Year of Median Incidence
Jan.	3.56	3.41	5.68	5.35
Feb.	3.23	3.31	5.05	4.17
Mar.	2.96	3.39	5.26	4.11
Apr.	3.52	3.85	5.27	5.19
May	5.63	5.56	5.00	5.51
June	11.54	10.46	5.80	6.13
July	18.28	17.79	7.89	8.68
Aug.	17.94	17.53	13.85	13.49
Sept.	13.40	14.07	17.00	18.06
Oct.	9.05	9.21	13.40	13.67
Nov.	6.36	6.53	8.79	8.82
Dec.	4.52	4.88	7.01	6.84

Table IV shows that each state exhibited in a general way the same seasonal distribution as the combined area to which it belonged. The results, therefore, which had been obtained were not due to the effects of one large state, in other words, to weighting.

An attempt was made to determine whether there had been any tendency for the seasonal distribution of cases to change with the passage of time. For the first three years and the last three years of

TABLE IV

PERCENTAGE SEASONAL DISTRIBUTION OF TYPHOID FEVER FOR A YEAR OF MEDIAN INCIDENCE  
CALCULATED FOR THE PERIOD 1915-1928 FOR VARIOUS STATES

Month	Southern States			Northern States				
	Louisiana	Mississippi	Alabama	Connecticut	New York	Minnesota	Wisconsin	Michigan
Jan.	3.94	3.33	2.61	3.12	5.62	5.27	6.98	5.04
Feb.	4.13	3.20	2.82	2.80	4.17	5.47	6.03	3.78
Mar.	3.67	3.10	2.34	3.43	3.59	7.42	6.35	5.63
Apr.	5.78	3.99	2.66	4.05	4.60	6.25	7.30	6.30
May	7.43	5.37	4.84	4.98	4.71	6.05	7.94	4.85
June	11.28	11.14	10.11	5.92	5.62	6.05	6.35	6.50
July	13.39	18.39	18.84	9.35	8.41	8.20	6.67	7.37
Aug.	14.86	16.31	22.57	18.69	14.13	11.91	9.84	11.15
Sept.	12.02	13.77	15.06	19.31	20.04	14.06	13.33	17.08
Oct.	8.81	9.85	9.26	14.95	14.20	14.65	11.43	15.23
Nov.	6.88	7.22	5.06	6.85	8.51	8.20	11.43	10.09
Dec.	7.80	4.35	3.83	6.54	6.41	6.45	6.35	6.98

the period 1915-1928 percentage seasonal distributions of cases were calculated. Because it had been found that computations based upon the mean gave results quite comparable to those based upon the median, the method just outlined—making use of the arithmetical mean—was employed. The results for both combined areas are presented in Table V, Figures IV and V. The percentage seasonal distribution of cases for each area has remained quite constant although there has been a marked decline in the incidence of typhoid fever. This is in agreement with Mills's<sup>6</sup> observation that over quite a long period

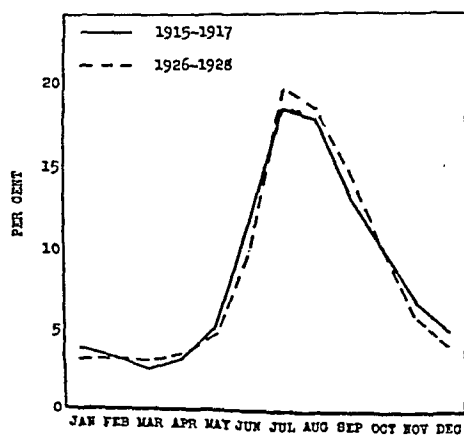


FIGURE IV—Percentage seasonal distribution of typhoid fever for a year of mean incidence calculated for three combined southern states

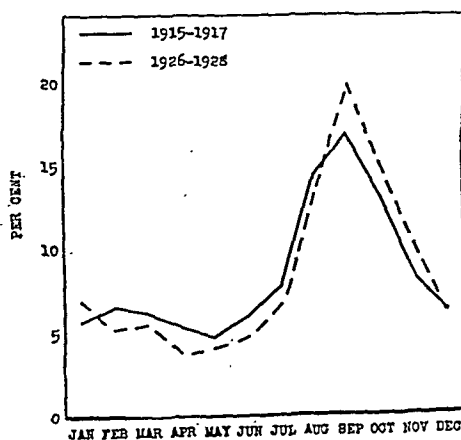


FIGURE V—Percentage seasonal distribution of typhoid fever for a year of mean incidence calculated for five combined northern states

there had been no change in the seasonal distribution of typhoid fever deaths in certain cities.

The incidence of typhoid fever per 100,000 population is much higher in the southern part of the United States than in the northern. The question arose as to whether the seasonal distribution observed

in the southern area might not be related to this concentration of cases. To investigate this point the seasonal distribution of the northern combined states for 1915-1917 associated with an incidence rate of about 4.6 was compared with that for the south-

TABLE V  
PERCENTAGE SEASONAL DISTRIBUTION OF TYPHOID FEVER FOR A YEAR OF MEAN INCIDENCE

Month	Three Combined Southern States		Five Combined Northern States	
	Calculated for the Period 1915-1917	Calculated for the Period 1926-1928	Calculated for the Period 1915-1917	Calculated for the Period 1926-1928
1	2	3	4	5
Jan.	3.94	3.20	5.77	6.88
Feb.	3.30	3.21	6.47	5.19
Mar.	2.48	3.15	6.12	5.44
Apr.	3.05	3.48	5.31	3.77
May	5.22	4.83	4.74	3.97
June	11.46	9.91	5.92	4.69
July	18.31	19.58	7.67	6.57
Aug.	17.67	18.31	14.12	13.00
Sept.	13.03	14.49	16.59	19.72
Oct.	9.91	9.91	12.90	14.90
Nov.	6.70	5.89	8.15	9.98
Dec.	4.93	4.04	6.23	5.89

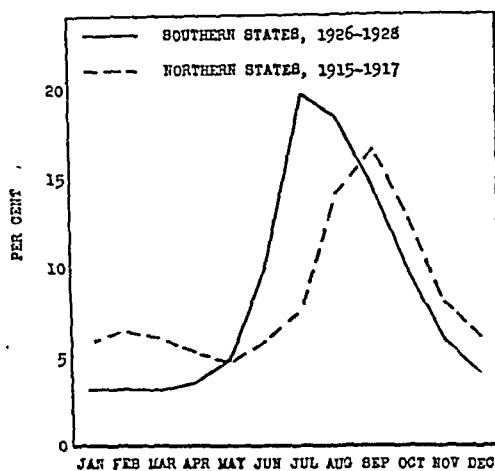


FIGURE VI—Percentage seasonal distribution of typhoid fever for a year of mean incidence calculated for certain areas and periods

ern combined states for 1926-1928 associated with an incidence rate of about 7.7. Table V, columns 3 and 4, together with Figure VI, further suggests that there is a distinct difference between the percentage seasonal distribution of cases for the two respective areas.

#### SUMMARY AND DISCUSSION

A comparison of the seasonal distribution of typhoid fever in certain of the southern and certain of the northern states has been made.

Evidence has been presented which indicates that for each latitudinal group the seasonal distribution of typhoid fever has not changed with the passage of time even though there has been a marked decline in the incidence.

Some evidence has been brought forward which tends to show that the seasonal distribution of typhoid fever is independent of the incidence rate.

It has been shown that each group has a distinct seasonal distribution.

The conclusion seems justified that the curve of the seasonal distribution of typhoid fever cases for the southern states differs from that for the northern states in reaching a maximum earlier, and in exhibiting a slight tendency toward a greater proportionate concentration of cases during the hot months of the year. This would seem to imply that there are forces favoring typhoid fever which operate during the hot part of the year with greater intensity and over a longer period of time in the south than in the north. Since the southern section experiences a high temperature earlier in the year than the northern, and since the period of high temperature lasts longer, the difference observed is what might have been expected if high external temperature were responsible for the greater prevalence of typhoid fever in summer.

Study of the seasonal curves for southern states or areas (Figures II, III, IV, V and VI) reveals the fact that they start to decline while the temperature is still high. How is this to be explained? Arnold's studies<sup>2,3</sup> suggest the possibility that after a period of exposure to a high temperature the body gradually adapts itself to this external condition, with the result that the altered defensive mechanism of the intestinal mucosa again becomes normal even before the advent of cold weather can produce any restorative effects, and that possibly the influence of high external temperature may be offset toward the latter part of the summer by changes in diet. While differences in the distribution of temperature between the southern and northern sections, either as it affects the human body, or perhaps the means of transfer, may be responsible for the observed differences in the seasonal distribution of typhoid fever, the effects of other possible variable factors such as moisture and ultra-violet radiation may need to be considered before a conclusion is reached.

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# Value of the Newly Identified Types in the Study of the Epidemiology of Pneumococcus Infections\*

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THE early work on pneumococci disclosed the fact that they did not all belong to the same immunological type. In this country and Europe, Types I, II, and III were isolated and preserved. In adults in New York and vicinity between 50 and 60 per cent of all pneumonia cases were found to be due to these types. The remainder were gathered together as Group IV. These pneumococci, however, did not really form a group. They were simply those which had not been classified, as I, II, or III. This separation of the three main types was most valuable, but the impossibility of identifying about one-half the pneumococci from cases of pneumonia in adults and two-thirds of them in young children, was a great drawback in detecting the spread of infection, and appreciation of this stimulated further investigation. Very briefly the history of the separation of additional specific types is as follows:

In 1915, Avery<sup>1</sup> separated from characteristic Type II pneumococci two sub-types which differed immunologically from each other and from Type II. A year later Lister<sup>2</sup> noted that in South Africa the most frequently occurring strain was of a type different from I, II, or III. Olmstead in New York during the same year made a study of 213 distinct strains of pneumococci and classified them into 12 immunological groups. Cooper<sup>3</sup> and Mishulow in 1919 and 1920 differentiated 19 types. Griffith<sup>4</sup> in 1922 studied 49 strains, none of which belonged to Types I, II, and III. He distinguished 12 distinct serological types. Robinson<sup>5</sup> in 1928 in Pittsburgh noted that in all the cases occurring in a localized outbreak of pneumonia in that city, only 1 type of pneumococci was obtained, and this was not I, II, or III.

These and other researches indicated the need not only of separating the Group IV pneumococci as far as practicable into the several types comprising it, but also of preserving the type strains, and for the

\* Read before the Epidemiology Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 4, 1929.

different types, a specific serum for each. The possession of the cultures and their specific serums would make it possible not only to utilize them to identify newly isolated pneumococci, but also to send them to other laboratories, so that the presence and frequency of any of these types in any other parts of the world could be determined. There would of course be other uses of these additional preserved types, such as determining their seasonable variations and estimating the curative value of a specific antibacterial serum for each.

After a conference, Cooper in 1927 decided to undertake this work. She has now identified, and has in her collection, cultures of 17 additional types. The majority of what would have previously been unclassified pneumococci can now be identified. Many interesting facts have been developed. Thus the pneumonia cases in adults and children in Bellevue and Harlem Hospitals have been typed, and we have noted the relative occurrence of the different types. Up to the end of 1928, she had only 13 types fully worked out. For each of these she had a specific agglutinating serum. Before referring to the results obtained it is necessary to note that Westlung<sup>o</sup> and others had noted a much larger percentage of Group IV pneumococci in the pneumonias of children than in those of adults.

Westlund's tabulation of the reports of others is shown in Table I.

TABLE I

## TYPES OF PNEUMOCOCCI IN PNEUMONIA

	Adults (1,552 Cases) per cent	Children (401 Cases) per cent
Type I	36.0	26.0
Type II	28.0	11.0
Type III	13.0	8.0
Group IV	23.0	55.0

Cooper's own investigations on the pneumonias of children yielded most interesting results (see Table II).

Turning to the results obtained in the Laboratories of New York and Cornell Universities in our own investigations we find the same general distribution of Types I, II, and III and Group IV, but now we have the added interesting information as to the distribution of a considerable percentage of the pneumococci into 10 other types, and of the differences of the percentages of each type not only between adults and children but also between older and younger children.

Before giving an example of the value of the possession of specific

TABLE II  
INCIDENCE OF PNEUMOCOCCUS TYPES IN CHILDREN

	<i>Lobar Pneumonia</i>	<i>Broncho- pneumonia</i>	<i>Other Respiratory Diseases</i>	<i>Non-respiratory Diseases</i>
	Uncomplicated (59 Cases)	Uncomplicated (23 Cases)	(13 Cases)	(48 Cases)
	Total Incidence per cent	Total Incidence per cent	Total Incidence per cent	Total Incidence per cent
Type I	6.7	8.7	0.0	0.0
Type II	16.9	8.7	30.7	8.3
Type III	1.6	4.3	0.0	2.1
Group IV	62.7	47.8	61.5	47.9
No pneumococci	11.8	30.4	7.6	41.6

serums for each of the newly established types in detecting an outbreak due to one of them, let us consider the stability of types.

It has been long established that the majority of people in cities carry pneumococci in their throats. These generally belong to the unclassified or Group IV strains. Now we realize that Group IV is simply the lumping together of a number of types, each of which is represented in adults by a smaller percentage of pneumococci than Types I, II, and III, but in children some of these predominate. Each of these types is just as clear-cut as I, II, and III.

TABLE III

THE RESULTS OF TYPING GROUPS OF ADULT PATIENTS FROM THE SERVICE OF DR. JESSE G. M. BULLOWA AT HARLEM HOSPITAL AND OF CHILDREN FROM THAT OF DR. HENDEE SMITH AT BELLEVUE HOSPITAL

*Incidence of Types in the Pneumonias of Adults, Infants and Older Children \**

Type	Percentage in 154 Adults	Percentage in 89 Infants	Percentage in 58 Older Children
I	30	4	19
II	18	1	4
III	11 59%	3 8%	0 23%
IV	6	3	2
V	2	0	15
VI	2	15	8
VII	4	3	4
VIII	1	0	2
IX	2	8	0
X	2	0	2
XI	1	0	0
XII	1	1	1
XIII	1	2	0
Unclassified	17 39%	57 89%	44 77%

\* Material from children obtained by Raia and typed by Schultz in the laboratories of Cornell University. Adult material typed by Cooper in the Research Laboratory of the Health Department.



Are the types of pneumococci fairly permanent, or are they constantly shifting? Griffith, in England, believes that they readily change and that this frequently happens at the time of convalescence. The results of our own researches agree with those of earlier investigations. Stillman found that during and after convalescence, the type of pneumococcus persisted for many days. In 53 cases of lobar pneumonia the shortest period in which the specific type persisted was 7 days, and the longest 85 days. Under natural conditions we expect therefore that a pneumonia due to a definite type of pneumococci will disseminate this type to others.

Let us now turn to a striking instance when one of the new types was responsible for an outbreak of pneumonia in an institution and in all probability of colds as well. Without a specific serum on hand the cause of the outbreak would have escaped us.\*

In an institution for the care of about 700 children between 3 and 16, equally divided between boys and girls, an epidemic of colds and pneumonia occurred. This developed among the boys with the exception of one girl. The outbreak occurred first among the younger children and then among the older who were in contact with them, and then among those of all ages. Schroder, who has charge of the immunization of the children against diphtheria and scarlet fever, happened to learn of the epidemic just as it was beginning to abate. She gathered as much data as possible as to the method of spread of the disease, and obtained culture material on swabs from the pharynxes of 9 cases. From this material Cooper obtained in 7 cases pneumococci which were found to be Type V of our new classification. The onset of the cases was characteristic of a local epidemic of a communicable disease. Within 10 days of the development of the first case the peak occurred. On one day 34 cases developed. The outbreak then rapidly declined. Of something over 100 children who were sick, 30 per cent had pneumonia. The others had symptoms and physical signs of either bronchitis or common colds. While all the 7 positive cultures were from cases of pneumonia, we have no doubt the cases of bronchitis and colds were also due to the pneumococcus, since there were all gradations in severity from the mildest cold to a fully developed pneumonia, and the different severities of the disease occurred proportionately throughout the attack. If Cooper had not had a specific agglutinating serum for the type there would have been no probability of working out the relation of the pneumococcus to the

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\* The full account of this outbreak, by Schroder and Cooper, will be printed in an early number of the *Journal of Infectious Diseases*.

outbreak. Through having accessible the specific serums for these added types, we have increased our chances of gaining valuable knowledge concerning the spread of pneumococcus infections, especially among children.

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## Antiseptics

THE old adage, "There is nothing new under the sun," is constantly being emphasized. In a recent publication,<sup>1</sup> there occurs an interesting discussion of the words "antiseptic" and "asepsis," which are generally considered to be of modern origin, yet "antiseptic" is found in medical literature in the middle of the 18th century, and was commonly used by the laity.

In the "Gentleman's Magazine" (1751) we find the statement, "Myrrh is twelve times more *antiseptic* than sea salt." St. Blancard's lexicon (1777) contains the following definition: "Antiseptica, sunt remedia interna et externa, quae putridini resistunt." According to Ebstein, the use of gloves in obstetrics was advocated in the year 1758.

An interesting letter by George Foster,<sup>2</sup> written in 1791, says: "I had no desire to eat, etc.—all the symptoms of a general breakdown. Drank quantities of vitrol acid and ate kraut conserve. In short I was kept *antiseptic* and after a few days I became better. I now felt hollow and empty and very weak on my legs."

Semmelweis and Lister both brought forward what we now call antiseptics, using sodium chloride, chloride of lime, alcohol, etc. The surgeons of that day seemed to use antiseptics with the idea of rendering decomposition harmless, but Semmelweis, who used them on his hands to prevent infection, said: "You should work with clean hands." Fleetwood Churchill said: "A *gentleman's hands are clean*."

An interesting sidelight is thrown on the slow acceptance of Lister's teaching in England. It was explained that the Germans were known as a dirty people, and therefore antiseptics might be necessary for them, but in England, they were superfluous. It was not necessary there to demand the cleansing and disinfecting of the finger nails because a "gentleman cleans his finger nails in his sleeping room."

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# Public Health Nursing Legislation What It Should Include\*

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**L**AWS governing public health nursing have been enacted in the majority of states, Massachusetts and Pennsylvania having been the first to pass such legislation in the year 1911. Since then laws have been placed upon the statute books nearly every year, and some of them have been repealed.

Many general health laws include public health nursing and provide for the employment of nurses, sometimes defining the type of work to be done, such as child hygiene, tuberculosis, school nursing, or other specialized work to which nurses are assigned. It is not intended here to give a résumé of the various state laws governing public health nursing. Such information may be found in *A Review of State Laws on Public Health Nursing* by James A. Tobey.<sup>1</sup>

In that study it is noted that there are no standard requirements; the territory covered may be state, county, city, town or village, or may not be designated. The duties in some instances apply to specialized work, or they may not be definitely defined; supervision is vested in the state commissioner of health, a health officer, county commissioners or county supervisors, school boards of trustees, or city or town councils, or no specific body may be mentioned to whom the nurse is responsible. In some state laws professional qualifications are outlined and in others none are mentioned.

It is realized that conditions vary in different parts of the country, which might make it seem to some that no standard regulations would be universally applicable. There are certain fundamental principles applying to public health nursing which were recognized as essential in the very earliest days of visiting nursing. The first and most important are that nurses shall be well prepared for the work, and that adequate supervision shall be provided. Some apply to the observance of professional etiquette, coöperation with other workers and

\* Read before the Public Health Nursing Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 3, 1929.

agencies, the importance of accurate records, and others as defined in *Public Health Nursing*, by Mary Gardner.

These principles have been adhered to wherever successful work has been engaged in, and will without doubt apply for all time everywhere.

It is assumed that the state is interested in recognizing the professional ability of the nurse as a community worker and that it desires to protect the public from untrained workers, and guard the profession against unskilled competition. The objectives in legislation governing public health nursing are:

1. To secure for the public the graduate nurses best prepared and otherwise qualified for public health work
2. To provide for the worker the best conditions under which to carry on the work

Legal standards should be minimum standards, and sufficiently flexible to provide for future developments in order to avoid frequent changes in the law which may lead into unforeseen difficulties. Good public health nursing laws should provide for the following:

1. The creation of a bureau or division of public health nursing in the state department of health, headed by a nurse director appointed by the state commissioner of health
2. The statement of minimum qualifications required for all public health nurses
3. The power of appointment by local authorities
4. The definition of duties
5. The creation of an advisory board or nursing committees

The director of such a bureau or division should meet the requirements as outlined by the National Organization for Public Health Nursing. She should have a good educational and professional background, be a worthy representative of her profession, and be familiar with all phases of nursing in her own state. She should have the power to develop her work, as other heads of divisions do, and a free hand in selecting personnel. She should be able to prepare and advise on budget requirements, salaries and travel expenses for staff nurses, clerical help, and equipment.

The purpose of a division or bureau of public health nursing is to educate, organize and standardize the service in the state; to supply qualified nurses to other divisions of the department; to meet qualifications set by the state department of health; to define duties broadly to include all branches of public health nursing; and to aid in securing the appointment of nursing committees representing public officials, representatives of medical societies and lay persons interested in or sponsoring the service.

A roster of public health nurses in the state (by counties) giving name, address, type of work, salary and preparation of nurse, and previous positions held, should be readily available for study and comparison, and other nursing information should be on file in good form.

In New York State the law created in 1913 states that there shall be a division of public health nursing in the State Department of Health, and the Public Health Law permits the Public Health Council (an advisory body) to prescribe the qualifications for public health nurses as also for health officers. This seems desirable to meet frequently changing requirements without continually enacting or repealing laws.

Such a division or bureau should—

1. Furnish advisory, supervisory or consultant service and conduct demonstrations
2. Place nurses and aid them in maintaining good standards
3. Provide record and report forms and supervise their use
4. Coöperate at all times with state and local agencies who are carrying on public health work, whether employed from public or private funds

For staff and for local appointment, nurses should meet the requirements of the nurse practice act in their own state and be qualified for public health nursing according to standards set by their state department of health. Legislation should permit local boards of health and education to employ nurses in cities, towns and villages.

The duties should be broadly outlined, covering the general phases of public health work, such as maternity, infancy and child hygiene, tuberculosis, social hygiene, communicable diseases, school nursing, and bedside care as needed in emergency.

The Public Health Law of New York State, Article III, reads as follows:

Each health officer or other official exercising similar duties, by whatever official designation he may be known, shall have power to employ such number of public health nurses as in his judgment may be necessary within the limits of the appropriation made therefor by the city, town or village. They shall work under the direction of the health officer and may be assigned by him to the reduction of infant mortality, the examination or visitation of school children or children excluded from school, the discovery or visitation of cases of tuberculosis, the visitation of the sick who may be unable otherwise to secure adequate care, the instruction of members of households in which there is a sick person, or to such other duties as may seem to him appropriate.

This seems to be inclusive of all duties to which a nurse may be assigned.

Legal provision for the appointment of an advisory council or public health nursing committee is a wise requirement. Such a committee should consist of members of the official body which employs

the nurse, representatives of the local medical society, preferably health officers, and lay persons who are interested in the progress of public health nursing or those who have previously sponsored the work, such as members of the nursing committees of the American Red Cross or representatives of civic and church organizations. Such a committee would be an important factor in avoiding political appointments of nurses and in other ways giving morale to the work.

What board members can do for the work was ably defined by Michael M. Davis, Ph.D., in an address on "Functions of Boards of Trustees and Committees," given at the American Nurses' Association Meeting and Institute for Board Members.\*

Ten Duties for Board Members—

1. To know why the organization exists and annually to review why it should
2. To govern a board or a committee through joint thinking, not by majority vote
3. To give money, or help get it, or both
4. To face budgets with courage, endowments with doubt, deficits without dismay, and to recover quickly from a surplus
5. To deal with the professional staff as partners
6. To keep far enough ahead of the community to be progressive, and close enough to it to be practical
7. To interpret health work to the public in words of two syllables
8. To deal with physicians on the assumption that the highest ideals of the profession dominate its every member and to face difficulties with recognition that both doctors and board members are human
9. To be proud of a tradition but eager to improve it
10. Always to combine a New England sense of obligation with an Irish sense of humor

When public health nursing legislation is proposed to be introduced in a state, a lawyer's advice should be secured. It is wise to give careful thought to the wording, defining the minimum requirements and making the law sufficiently flexible to allow for the constant expansion in public health activities.

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\* Reprinted in *Am. J. Nurs.*, June, 1929.

REFERENCE

1. Reprint from *Pub. Health Nurs.*, 15, 4: 179 (Apr.), 1923. A 1930 revision will appear in *Pub. Health Nurs.* in an early issue.

## EDITORIAL SECTION

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## ANTIRABIC TREATMENT PARALYSIS

THE appearance of paralysis during and following the administration of antirabic vaccine is one of the accidents which we must recognize as inherent in the preventive treatment. Fortunately, its occurrence is rare, but unfortunately, the etiology is unknown, in spite of the study which has been devoted to the matter.

The explanations given have not been satisfactory. Some have held that it was due to a dose of the street virus which without the vaccine would have proved fatal, and others that it was directly due to the fixed virus. Busson holds that under certain conditions the fixed virus may become neurotropic, and lays stress on the presence of fixed virus in the nervous system of those who succumb. Tinti considers it an anaphylactic phenomenon. Harris feels that individual susceptibility to rabbit brain is the chief factor. It is now widely believed to be due to the action of some unknown substance contained in the vaccine. We can only accept the statement of the Rabies Conference that our knowledge does not enable us to make positive assertions as to the etiology.

Among the predisposing causes, alcoholism, syphilis, neuropathic constitution, cold, fatigue, and overwork were mentioned at the International Rabies Conference in 1927, at which Remlinger presented a study of the accidents following vaccination against rabies in Pasteur Institutes which covered practically the entire world.

In the vast majority of cases, the injection of living fixed virus vaccine is harmless. Paralytic accidents are less frequent when glycerinated or carbolized vaccines are used, and for this reason, some insti-

tutes have adopted the use of dead or attenuated material, though cases have followed the use of all methods. Those affected are most commonly between 20 and 60 years of age, and belong to the intellectual professions, comparatively few cases occurring among the natives of tropical countries and children. The intensive treatment is more often followed by paralysis than the regular.

In view of the facts, the Pasteur treatment should not be advised without a careful consideration of all the circumstances. On the other hand, since its protective value is undoubted, and wonderful results have followed its use, it should not be withheld from an exposed patient without good reason. With a definite diagnosis of rabies in the biting animal, and a wound, there should be no hesitation in giving the treatment. The International Rabies Conference was equally divided as to the necessity of treatment of persons with whose skin the saliva of a rabid animal had come into contact, even when there was no visible break. The number of deaths from post-vaccinal paralysis is about 100 times that of cases of hydrophobia due to the licking of the skin by rabid dogs. When the mucous membrane was contaminated in this manner, the great majority advocated the Pasteur treatment.

In certain cases, it seems advisable to keep the patient at rest in bed, but the large number of patients who take the treatment at home and pursue their ordinary avocations without bad results, indicates that this measure should be taken only in extreme cases.

The number of cases of paralysis varies, but in all series reported, the percentage is extremely small, and fatal cases are rare.

Remlinger gives the percentage of cases as 0.28 per 1,000, or 1 for every 3,538 persons treated. When symptoms appear during treatment, as they do in about two-thirds of the cases reported, the injections should be discontinued, and the patient put at rest. The reports of two recent cases,<sup>1</sup> one fatal, and one ending in recovery, describe the symptoms and give additional facts.

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1. *New England J. Med.*, Jan. 23, 1930.

### HOW MUCH TOXIN-ANTITOXIN IS NECESSARY

THE Michigan Department of Health has made exhaustive studies on the amount of toxin-antitoxin work necessary to rid a community of diphtheria. While this varies widely, depending upon density and age distribution of the group immunized, some generalizations are evident.

The department has been furnishing toxin-antitoxin free of charge for a period of 6 years. The counties, cities and smaller districts that



have immunized ten times as many persons as are born in a single year have had no diphtheria. A number of the more progressive cities and districts have accomplished this in 5 years by immunizing children to the extent of approximately double the number of births each year. After the first 5 years of this intensive work, the community can be kept free from diphtheria if the number of persons immunized encompasses the number of births. The only proviso is that the work be carried on in the preschool group, with the objective that every child be immunized as soon after 6 months of age as is possible.

This experience seems to be sufficiently widespread to be considered a reproducible phenomenon. As a result, the Michigan Department of Health is using as a standard the cities and communities where diphtheria has been made "ancient history" by immunizing each year for a period of 5 years a number of persons equivalent to twice the number of births, and thereafter campaigning for the immunization of all children as soon after 6 months as possible.

### FORENSIC BLOOD TESTS

**B**ECAUSE the health department has a laboratory and because the material studied is biological in character, the health officer is often expected to furnish not only laboratory service but expert opinion on many phases of forensic medicine. Such matters are primarily police problems, yet both law and custom have made them a duty of the health department. With many of these examinations the results are sufficiently definite to cause no particular hesitancy in accepting and reporting them, but when blood is involved, the health officer as an expert witness finds himself in difficulty unless he has had considerable experience and is more or less familiar with the literature on this subject.

The so-called blood tests are of two kinds, those to determine the kind of blood in evidence, and those concerning paternity. The technic of both is sufficiently well known and perfected, although with each the greatest care is necessary to prevent errors and to secure controls. If there is any popular opinion about these tests it is that with the first the technic is involved and the interpretation simple, while in the second (paternity tests—involving blood grouping) the technic is simple and the interpretation difficult. The literature, however, reveals the fact that in any case the method is by far the more significant. In attempting to determine the source of an unknown blood specimen, the method of doing that particular test is most important. In so far as paternity tests are concerned, the technic upon which the theory of inheritance itself rests must be taken into account.

If there were no questions of technic there would be little difficulty in determining the correct theory of inheritance.

The methods for performing precipitation tests upon blood the source of which is to be determined are well described in numerous textbooks of serology and forensic medicine. It is not necessary to consider this question further, except to add that Lattes (1927)<sup>1</sup> reported a type of investigation which may develop sufficiently to give much greater value to such tests. This investigator introduced a method for determining the group of the unknown blood in cases where it proved to be of human origin. Thus it may soon be possible to exclude certain individuals from connection with a given investigation or more definitely to involve another.

It is in testifying to paternity that the health official finds the most uncertainty and hence the greatest difficulty. The whole problem has been reviewed by Snyder (1927). It is concerned chiefly with the question of method of inheritance of the Mendelian factors. The fact that blood groups are subject to Mendelian inheritance is generally accepted, but there remains the problem as to whether two pairs of independent Mendelian factors (iso-agglutinogens A and B dominant to their iso-agglutinins a and b) or a series of three multiple allelomorphs (A and B dominant and O recessive) are inherited. In so far as the first three groups O, A, and B (or I, II, and III Jansky) are concerned the possibilities are identical regardless of which of the two theories is accepted. When either parent is of group AB (IV Jansky), however, the interpretation depends upon the theory accepted.

According to Snyder the theory of multiple allelomorphs is confirmed by the facts, yet for medico legal purposes it would seem unwise to accept this premise until it has been more definitely estab-

TABLE I

RESULTS OF BLOOD GROUP CROSSINGS COMMON TO BOTH THEORIES	
Mating	Offspring
O + O	O
O + A	O, A
O + B	O, B
A + A	O, A
B + B	O, B
A + B	O, A, B, AB

lished. On the other hand, the results, with which both theories accord, are sufficiently proved to warrant their legal application. As a matter of fact in certain countries, notably Germany, blood grouping is assigned a definite place in legal procedure, and the qualification of expert witnesses as well as the extent of the value of their testimony

is definitely fixed. It would appear that in the United States blood groupings might be more extensively used as evidence with the understanding that all parties, from judge to witness, accept the more or less tentative value of the report. As a support to other evidence the results of blood grouping are of value. As a proof of an existing condition, it might cause injustice.

TABLE II  
MATINGS IN GROUP AB

Mating	Inheritance by dependent pairs	Inheritance by multiple allelomorphs
O + AB	O, A, B, AB	A, B
A + AB		
B + AB	O, A, B, AB	A, B, AB
AB + AB		

To indicate the possibilities in this field, Tables I and II are presented. A more complete summary is given by Snyder,<sup>2</sup> and the work of Furuhashi<sup>3</sup> is well worth study.

#### REFERENCES

1. Lattes. *Deutsch. Ztschr. f. d. gerichtl. Med.*, 9: 402, 1927.
2. Snyder, L. H. *Arch. Path. & Lab. Med.*, 4: 215-257, 1927.
3. Furuhashi. *Japan Med. World*, 7: 197, 1927.

### FIRST INTERNATIONAL CONGRESS ON MENTAL HYGIENE

AN unusual meeting will occur in Washington, D. C., May 5 to 10. This is the First International Congress on Mental Hygiene. From nearly all European countries, from several South American countries and from Japan and China, delegates will attend.

One reason why this will be an unusual gathering is that, for the first time in history, people who are interested in mental hygiene from many different angles will meet together to discuss common or related problems. There have been meetings of physicians interested in the care and treatment of the mentally sick. There have been gatherings of educators at which mental hygiene was discussed. There have been congresses of both doctors and nurses, with some attention paid to psychological factors in etiology and treatment. There have been meetings of criminologists, in which mental factors as causes of crime were thoughtfully considered. But here all these groups, and many others, will be present. The common interest of these numerous participants will be the recognition that mental and emotional conditions are important with respect both to disease and to conduct, and that teacher, physician, parent, nurse and many others share the opportunity to promote positive mental health as well as to avert nervous and mental disease.

Dr. Haven Emerson wrote some emphatic words about preventive measures in health fields, which apply as forcefully to the field of mental health as to that of physical health:

May I be permitted to suggest that it takes a higher type of intelligence, a greater faith, a truer sense of perspective, to foresee the approach of disease and protect against it, to see the enemies of health from afar, go out to meet them, outmaneuver them, outflank them, and down them by counter-attack, than to heal or tend existing disease? . . . We have arrived at a point in the organization of our national effort for health where advances in the fields already preëmpted and liberally supported by public opinion and resources must wait for their entire success upon a fair beginning and progress in the most delicate and difficult and yet the most promising undertaking of all—the prevention of nervous disorders and mental defects.

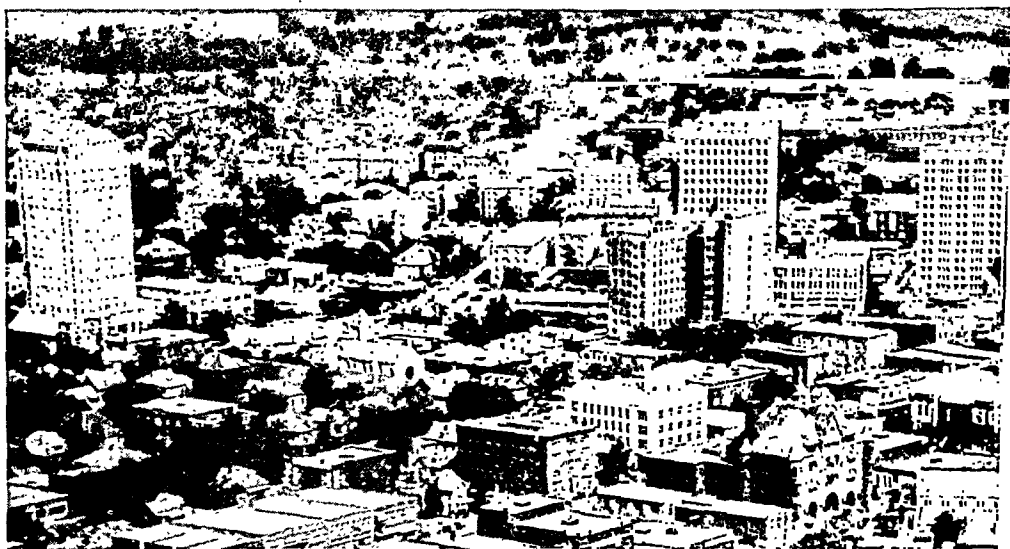
Health officers do not always see clearly what function they have in relation to mental hygiene. Some specific suggestions from Dr. Frankwood E. Williams, medical director of the National Committee for Mental Hygiene, bear on this question:

In considering, therefore, the future development of organized mental hygiene work in this country looking to the prevention of nervous and mental disorder, of delinquency, social inadequacy and dependency, it is apparent (1) that the public health officer in his epidemiological work contributes directly and importantly to one phase of mental hygiene work; (2) that in his attack upon the incidence of syphilis and his campaigning for the adequate, early treatment of those infected with syphilis, he contributes again in a very direct way to an important aspect of mental hygiene; (3) that in his campaign of education for the maintenance of better physical health generally, he contributes to that part of mental hygiene concerned with the prevention of nervous and mental disorders due to physical deterioration; (4) that the prevention of those disorders, personal and social, which are dependent upon the emotional and intellectual qualities and training of the individual, does not lie clearly in any one professional field, such as that of the public health officer, but must be accomplished through the professional coöperation of various groups, particularly those who have to do with the activities of children.

Every day the work of the health officer, the general practitioner, and the nurse is made easier and more effective because their patients, their patients' families and the communities in which they labor are intelligent and coöperative. Mental hygiene aims at intelligence and coöperativeness on the part of all men. To physician and nurse the issues of mental health, mental illness and mental invalidism are vital. We are sure that the proceedings of this Congress will prove interesting to our readers; some doubtless will attend, others will read the published reports.

President Hoover has accepted the position of Honorary President of the Congress.

NOTE: Information about it may be obtained from John R. Shillady, Administrative Secretary, 370 Seventh Ave., New York, N. Y.



*Panorama of the Business Section*

## HISTORY OF FORT WORTH

**V**AST changes have been wrought in most American cities during the past thirty years, but in few have these changes been more spectacular and revolutionary than in Fort Worth.

The census of 1900 showed a total population of 26,688. The tallest building in the city was eight stories in height. But Fort Worth was served by an electric street railway, having electrified its lines in 1888, the first American city to do so.

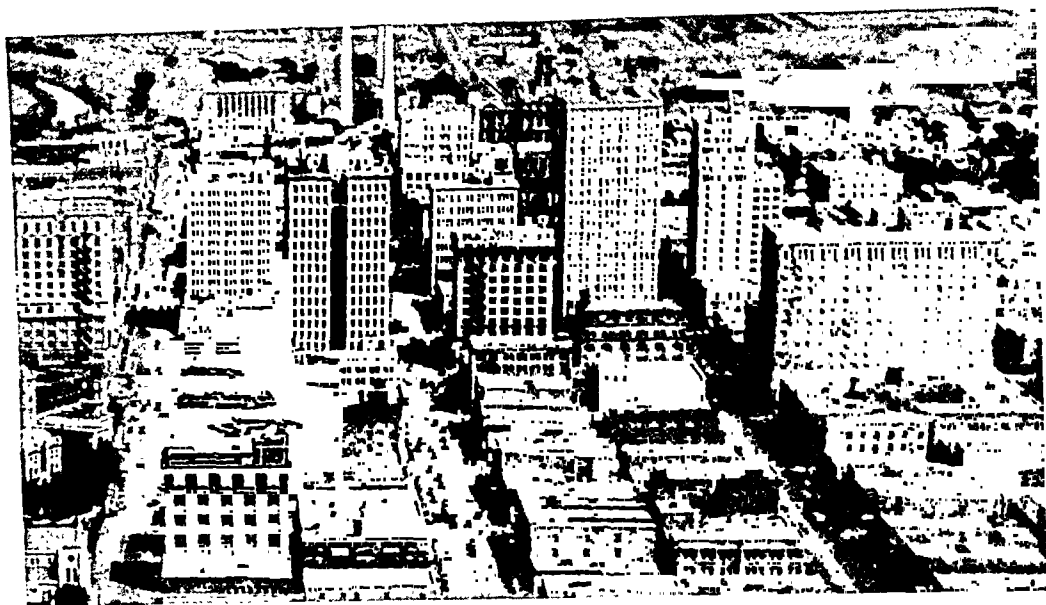
If the town was small, it contained big men. They were truly giants in those days. Living on the frontier, far from the centers of population, they were fully impressed with the importance of adequate transportation. At tremendous sacrifices they raised bonuses of cash and lands that by 1900 had brought to Fort Worth the Texas & Pacific, The Fort Worth & Denver City, The Gulf, Colorado & Sante Fe, The Missouri, Kansas & Texas, The Houston & Texas Central, The Fort Worth & Rio Grande, The St. Louis-Southwestern, and The Chicago, Rock Island & Gulf railroads. Fort Worth

became and has remained the most important railroad center southwest of Kansas City.

It was the foresight of the pioneers in reaching out for the railroads that made possible the tremendous growth that Fort Worth has experienced. With a preferential trade territory in West Texas that is larger than the states of Illinois, Indiana and Ohio combined, Fort Worth had lagged for the reason that distances were so great and the population of her territory so thinly spread that it was an unprofitable area to serve.

But the turning point had been reached. In 1902 the Armour, Swift, and Libby, McNeill & Libby packing houses were built, representing an investment of more than \$10,000,000. They became the largest industrial group in the Southwest. With the stockyards company, the horse and mule dealers, livestock commission men and allied industries they today employ more than 5,000 persons.

The building of the packing houses brought a great influx of new popula-



*Fort Worth, Texas*

## THE 59TH ANNUAL MEETING CITY

tion and lent a stability to the community, making it the center of the packing industry for the Southwest. Between 1900 and 1910 Fort Worth's population increased from 26,688 to 73,312.

The outstanding event of the next decade in Fort Worth's history was the establishment in 1917 of Camp Bowie, on the western boundary of the city. At the same time Talliaferro, Barron and Caruthers flying fields were located within a 14-mile radius of Fort Worth. In addition to the American aviators at the fields there were hundreds of members of the Royal Flying Corps of Canada.

Hard upon the heels of the establishment of the army camps came the news of the discovery of oil at Ranger, succeeded a few months later by a discovery of a new field at Burkburnett. These discoveries marked the beginning of the great West Texas fields which doubtless contain the largest oil reserves in the known world.

Meanwhile the cutting up of the great ranches of West Texas had begun.

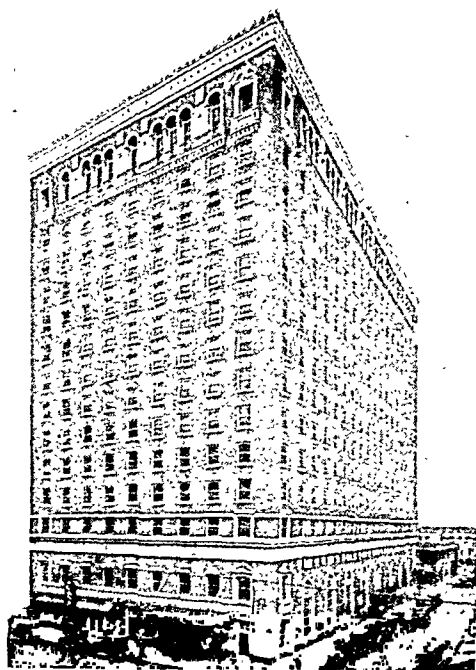
Wheat fields in the Texas Panhandle produced so bountifully that with the high prices current in 1919 many farms were paid for out of the one crop. Cotton growing had been extended westward and in the South Plains the government tests had shown that cotton could be produced more cheaply than in any other section of the Cotton Belt. The sorghum grains, Kaffir corn, Milo maize and Feterita produced so bountifully throughout West Texas that the farmers were assured of a feed crop which made stock raising and feeding profitable.

All of these factors combined to bring a great movement of agricultural population into West Texas about 1920. Since that time the population of the area has increased at the rate of 100,000 a year. A recent survey of the population of thirty typical West Texas cities showed an average increase of 200 per cent since 1920.

West Texas is now producing new wealth to the value of more than three-quarters of a billion dollars a year. Petroleum and natural gasoline contribute

\$265,000,000; cotton and cotton seed \$175,000,000; livestock \$125,000,000, and grain \$100,000,000.

Fort Worth, the gateway to West Texas, its supply point and its market place, has naturally reflected this growth. Credited with a population of 106,482 in the 1920 census, a recent



*Texas Hotel,*

*Headquarters for A. P. H. A. Meeting*

survey indicates a present population of 202,316. It is a city of skyscrapers, pleasant parks, fine schools and colleges, and comfortable homes.

Some idea of its activities may be gained from the fact that in the city and county there is now under way a construction program involving \$60,000,000.

Bids have been called for by the Texas & Pacific Railway for a new pas-

senger station and terminal warehouses that will cost \$8,000,000. A good roads program in Tarrant County, of which Fort Worth is the county seat, involves the expenditure of \$10,000,000. Two dams on the West Fork of the Trinity River will cost \$6,500,000. The reservoirs created will give Fort Worth a water supply sufficient for 1,000,000 people and make possible the irrigation of 52,000 acres of land.

Probably the most constructive step taken by the City of Fort Worth during its recent history was the adoption of a new charter in 1925. Theretofore the city hall had been a rendezvous for politicians. But the charter provided for the Council Manager form of government. At the solicitation of voters, nine of the outstanding business and professional leaders of the city agreed to accept nominations as councilmen. They were elected and have since been returned at the two succeeding municipal elections. The only changes that have occurred have come through death or resignations.

The council chose a city manager of outstanding ability. Every department of the city government was reorganized. Public improvements that have cost many millions of dollars were undertaken and approved by the voters, who felt that they were getting the full worth of the money expended. Streets have been widened; underpasses provided; storm sewers built; water and sewer mains extended; white ways installed.

Absolute confidence in the integrity of the city government has resulted in the voters of Fort Worth standing behind every proposal for municipal improvements. A thoroughly modern metropolis, humming with industry and athrill with prosperity, has supplanted the "cow town" of thirty years ago.

# ASSOCIATION NEWS

## A. P. H. A. REPRESENTED AT LATIN-AMERICAN MEDICAL CONGRESS

UPON the invitation of officials of the Mexican Federal Health Department, Homer N. Calver, Executive Secretary of the American Public Health Association, and members of the Texas State Health Department staff attended sessions of the Latin-American Medical Congress held in Mexico City during the week of January 13. Delegates from the various states of Mexico and Central America, as well as South American republics, participated in the meeting. Also representatives of the American Public Health Association and the U. S. Public Health Service attended.

A joint conference was arranged for members of the Texas Health Department staff, the Federal Health Department of Mexico, the U. S. Public Health Service, and the American Public Health Association to discuss the importance of mutual coöperation in matters of sanitation along the Texas-Mexico border.

Preliminary plans were laid for a large delegation of Mexican health workers to attend the A. P. H. A. meeting at Fort Worth next October. Plans were considered also for delegates at that meeting to make a short visit to Mexico City.

## NEW MEMBERS

### *Health Officers Section*

H. W. Darby, M.D., St. Louis Park, Minn., Health Officer  
Wilbur A. McPhaul, M.D., Charlotte, N. C., City-County Superintendent of Health  
Benton C. Wilson, M.D., Medford, Ore., Health Officer  
Richard Felton, M.B., B.S., Victoria, B. C., City Medical Health Officer  
Martin H. Jensen, M.D., Sweetwater, Tex., Director, Nolan County Health Unit  
Griem L. Johnson, M.D., Harrodsburg, Ky., County Health Officer  
Thomas C. Watson, M.D., Benton, Ark., City Health Officer  
Henry P. Dengler, M.D., Summit, N. J., Health Officer  
Frank F. Sowers, M.D., Fairmont, W. Va., Health Officer, Marion County  
Lucien T. Lee, M.D., Selma, Ala., City and County Health Officer  
H. Jackson Davis, M.D., Dr.P.H., New York, N. Y., Recently Deputy District State Health Officer  
George S. Eveleth, M.D., Little Falls, N. Y., Health Officer  
Robert J. Gillespie, San Benito, Tex., County Health Worker  
Clyde W. Beson, M.D., Oklahoma City, Okla., State Health Commissioner  
George H. Sumner, M.D., Asheboro, N. C., County Health Officer of Randolph County

Matthew E. Soller, M.D., Ypsilanti, Mich., Health Officer  
Gordon P. Jackson, M.B., Toronto, Ont., Medical Officer of Health  
Frank L. Rose, M.D., Saginaw, Mich., Health Officer of Saginaw County

### *Laboratory Section*

Richard P. Fowler, B.A., Oberlin, O., Bacteriologist, Lorain County District Board of Health  
Irving L. Dahljelm, Highland Park, Mich., Bacteriologist and Chemist, Department of Health  
George D. Cummings, B.S., Lansing, Mich., Bacteriologist, Department of Health  
M. E. Alpers, Dover, N. J., Bacteriologist, Department of Health  
Paul J. Beard, Ph.D., M.S., Stanford Univ., Calif., Instructor in Sanitation, Bacteriology Department, Stanford University

### *Vital Statistics Section*

Alice M. Hill, A.B., New York, N. Y., Statistical Field Secretary, National Tuberculosis Association

### *Public Health Engineering Section*

Andrew M. Jensen, B.S., Fresno, Calif., Commissioner of Public Works



*Industrial Hygiene Section*

Byron E. Neiswander, M.D., Columbus, O.,  
Chief, Division of Industrial Hygiene, De-  
partment of Health

Ezra Kagan, Kharkhov, Ukraine, Director of  
State Institute for Pathology and Hygiene  
of Labor (Assoc.)

*Food, Drugs and Nutrition Section*

E. R. Quackenbush, B.S., St. Paul, Minn.,  
Secretary, Twin City Unit, National Dairy  
Council

Thomas Moore, B.V.Sc., Guelph, Ont., Veteri-  
nary Inspector, Department of Agriculture

*Child Hygiene Section*

William Weston, M.D., Columbia, S. C., Chair-  
man, South Carolina Food Research Com-  
mittee (Assoc.)

Elizabeth S. Horton, B.S., Weston, Mass., De-  
partment Medical Coöperation, Earnshaw  
Sales Co. (Assoc.)

Mrs. C. A. VerNooy, A.B., Athens, Ga., Chair-  
man, Georgia May Day Committee (Assoc.)

Elizabeth L. Clark, M.D., Cincinnati, O.,  
School Medical Examiner

Mrs. L. C. Ross, Ellis, Kans. (Assoc.)

George F. Badger, Detroit, Mich., Assistant  
Epidemiologist, Department of Health

James Houloose, M.D., Long Beach, Calif.,  
Supervisor, Public School Health Service

*Public Health Education Section*

Deborah H. Veneklasen, R.N., Midland, Mich.,  
Chief Nurse, Midland County Health Unit

Florence F. Goodrich, B.A., Marquette, Mich.,  
Instructor in Public Health Education,  
Northern State Teachers College

J. Paul Frantz, M.D., Clearfield, Pa., Chief of  
Chest Clinic, Department of Health

Lillian M. Bushong, R.N., Asheville, N. C.,  
Resident Nurse, Normal School

Sarah G. Mayer, A.B., Washington, D. C.,  
Research Worker in Public Health Education

Lucia A. Kendall, B.S., New Haven, Conn.,  
Assistant Health Education Secretary, Y. W.  
C. A.

Arthur E. Benjamin, Minneapolis, Minn. (As-  
soc.)

Thomas A. Gardner, D.D.S., Iowa City, Ia.,  
Director, Bureau of Dental Hygiene, State  
University of Iowa

*Public Health Nursing Section*

Lydia W. Reitz, R.N., Saginaw, Mich., Visit-  
ing Nurse, Metropolitan Life Insurance Co.

Nell Peterson, Sioux Falls, S. D., School Nurse

Mary E. Hoover, Ypsilanti, Mich., School and  
City Public Health Nurse

Margaret G. Arnstein, R.N., Yorktown  
Heights, N. Y., Public Health Nurse, North-

ern Westchester District Nursing Association  
Esther M. Gustafson, R.N., San Luis Obispo,  
Calif., Supervising Public Health Nurse, De-  
partment of Health

Kate M. Ritter, R.N., Riverside, Calif., Chief  
Nurse, Sherman Institute, U. S. School for  
Indians

Lauretta Hamlen, R.N., New York, N. Y.,  
School Nurse, Department of Health

Ellen M. Johnson, P.H.N., San Francisco,  
Calif., Supervising Nurse, Department of  
Health

Margueritte Cunningham, R.N., Ft. Worth,  
Tex., Supervisor of Nurses

*Epidemiology Section*

Gaylord W. Anderson, M.D., Brookline, Mass.,  
Epidemiologist, Massachusetts Department of  
Health

William J. Murphy, M.D., Lansing, Mich.,  
With Bureau of Epidemiology, Department  
of Health

Donald E. Camp, M.D., Midland, Mich.,  
County Health Officer

Russell B. Howard, M.D., Grayling, Mich.,  
Director, County Health Department

Carleton Dean, M.D., Eaton Rapids, Mich.  
(Assoc.)

*Unaffiliated*

Joseph W. Fuller, D.D.S., Jacksonville, Fla.,  
Charge of Dental Clinic, Department of  
Health

Jacobo S. Armijo, Albuquerque, N. Mex.,  
Sanitary Inspector, Bernalillo County Health  
Department

George W. Dick, D.D.S., Sumter, S. C., Mem-  
ber, Executive Committee, State Board of  
Health

William H. Beatty, New York, N. Y. (Assoc.)

*Sustaining Members*

Pease Laboratories, New York, N. Y.

Mrs. Frederick Peterson, New York, N. Y.

## DECEASED MEMBERS

William Royal Stokes, M.D., Baltimore, Md.,  
Elected Member 1899, Fellow 1922

A. W. Akerley, M.D., Somers, Mont., Elected  
Member 1917

Emile Berliner, Washington, D. C., Elected  
Member 1919

Frederick William Browning, M.D., Hayward,  
Calif., Elected Member 1920

Joseph S. Cohn, M.D., Chicago, Ill., Elected  
Member 1918

J. E. Farr, M.D., Eau Claire, Wis., Elected  
Member 1924

Arthur Rigby, Winnipeg, Man., Elected Mem-  
ber 1921

# PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

**Diphtheria Problem**—Diphtheria, scarlet fever, measles, and whooping cough are primarily diseases of childhood although the first two mentioned are frequently met with at other ages. The diphtheria bacillus has been found in 12 per cent of new-born babies but in 60 per cent of such instances the mother was infected at the same time as the child.

Particular attention is drawn to mild or "missed" cases which determine in individuals an immunity which is considered to be natural but which is in reality due to an unobserved mild attack.

Diphtheria morbidity began to decline in most European countries around 1894 before the general use of antitoxin, although in several countries the incidence remained at a fairly constant level. After this decline the morbidity has remained almost stationary in the majority of countries. The fall in the amount of the disease since 1895 may have been due in part to the general improvement of living conditions among the poorer classes. Epidemics of diphtheria in Europe during the middle of the last century may, however, have produced a natural immunity in the population. It is a well known fact that a number of epidemic illnesses may confer immunity on a large section of a population resulting in the prevalence of milder forms of the disease. When antitoxin was discovered (1895-1896) the disease had only a slightly higher morbidity than is the case at the present time.

On the other hand, the mortality from diphtheria has diminished considerably—in Norway from 79.8 per 100,000 in-

habitants in 1894 to 25.2 in 1895 and 17.0 in 1896; in the Netherlands from 33.2 in 1894 to 20.7 in 1895 and 19.6 in 1896. Similar mortality drops occurred in Germany, Denmark, Scotland, France and Italy. In England prior to the introduction of antitoxin the mortality had been much lower than in some of these continental countries and the reduction since that date has not been so pronounced. In fact the English mortality during recent years (1925 to 1927) has been higher than that of the other countries.

A high proportion of cases with paralysis has been reported during the last three years. The case mortality has been high and has varied among different races. Fletcher examined 276 school children, of whom 172 were Malays and 104 Chinese, in the Federated Malay States. The Schick reaction was negative among the Chinese and Hindus in 76 per cent of cases, while among Malays the test proved negative in 91 per cent of cases. American workers have found a high per cent of natural immunes in the Philippines.

The relative absence of diphtheria in the tropics can be attributed to the large number of immune persons. Perhaps such immunity is due to widespread epidemics in past centuries which were not reported. Park and Zingher have shown that Italian children are more immune than American. This is attributed rather to difference of social state, as the Italian born children belong to the poorest classes of America.

The natural immunity which exists among tropical peoples may possibly be due to the same causes as produce immunity among the

poorer classes in the United States and in Europe. Such causes appear to be of a social rather than a racial order, because the great majority of natives of tropical countries belong to the poorer classes. The spread of epidemics of diphtheria among the peoples living under conditions of over-population and lack of sufficient material supplies has led to the production of an immunity which is now termed natural.

Active immunization against diphtheria is now practiced in three principal ways, (1) toxin-antitoxin, (2) antitoxin, and (3) vaccines. Immunization by vaccination, by mouth and by friction with an ointment containing bacteria and toxoid has been attempted. (The author describes results reported for each method.)

The value of active immunization against diphtheria, practiced according to recognized methods, is undoubted. The control of diphtheria mortality, which during the last few years has suffered a partial check, appears now to have taken a new form, and the time is perhaps not far off when lasting progress is assured.—General Review of the Diphtheria Problem in Recent Years, *Month. Epidem. Rep.*, League of Nations, June 15, 1929.

**Cancer Studies**—For the past 6 years Detroit has had a "cancer week" to teach the public early symptoms and the need of early diagnosis and treatment. During these special weeks, 7,767 individuals have presented themselves for examination. Four per cent have been found to have cancer, and an additional 12 per cent have had precancerous conditions requiring attention.

In 1927 the Detroit Department of Health established a Division of Cancer Control with an annual appropriation of \$16,000. The personnel included 3 part-time physicians, 2 public health nurses and 1 clerk. Starting with the death certificate an epidemiological study has been made of every cancer death from the onset of symptoms to the diagnosis, the record of treatment, and subsequent course after treatment. A Central Follow-up Registry has been established for living cases which are voluntarily reported by private physicians and hospitals. These follow-up histories are being made available to the profession through the county medical society.—Harry C. Saltzstein, Cancer Educational Activities, *City Health*, Detroit Health Dept., Nov.-Dec., 1929.

# LABORATORY

C. C. YOUNG, D. P. H.

## REPORT OF LIGHT TYPHOID OUTBREAK IN WHITTIER, CALIF., WITH SPECIAL REFERENCE TO THE LABORATORY FINDINGS

LEONARD HEDDICK

*Murphy Memorial Hospital, Whittier, Calif.*

IN the latter part of October, 1929, a light outbreak of typhoid fever occurred in Whittier, Calif. The first 3 cases were diagnosed and reported simultaneously to the Health Officer, Dr. F. G. Crandall, who immediately started an investigation. It was found that all of them consumed raw milk from the same dairy company, which obtained its raw milk from two dairies. Inquiry at the distributing plant revealed that these patients used milk from one of these. Dr. Crandall ordered all milk from this dairy to be pasteurized until further notice. The source of infection was found and preventive measures instituted in less than 24 hours.

At the suspected dairy there were no cases of illness, but one of the milkers had gone home sick October 5, and had not returned. He was traced to his brother's home in Artesia, a few miles away, and was found to be convalescing from a recent illness diagnosed by his family physician as "intestinal flu." Typhoid had not been suspected and no laboratory tests had been made. This man was about to start work in the dairy of his brother with whom he had stayed during his illness. A Widal showed complete agglutination in 1-320 dilution, partial at 1-640, para A and B negative. Eight stool specimens were negative.

Dr. Crandall could obtain no clue as to where this milker got his infection, but felt satisfied that he was the source of the outbreak. There were 7 cases, 6 described here, the 7th being a relative of the milker from a distant city who visited him during his illness and later came down with the disease. Five of the cases consumed milk from the dairy implicated, the 6th being a child living in the same house with the milker. Five were young children, 1 a boy of 17, and 1 a man of 30 years of age.

This milker left the dairy October 5, and the following cases cropped up about 14 days after he left—the approximate incubation period.

*Case No. 1*—Widal negative, feces negative. Widal repeated after 2 days negative. Blood culture positive in 24 hours. Blood culture again positive in 24 hours after 4 days.

*Case No. 2*—Widal 1-40, only. Blood culture taken at the same time positive after 3 days incubation.

*Case No. 3*—Widal negative. Blood culture taken same time positive.

*Case No. 4*—Feces negative. Widal 16 days later positive 1-320 dilution.

*Case No. 5*—Widal positive 1-320.

*Case No. 6*—Two feces examinations negative. Widal positive 1-160, partial 1-640.

*Case No. 7*—A 2-year old child in the home of ill milker. Widal negative. Blood culture positive in 18 hours for Gram-negative motile bacilli. Feces 9 days after positive blood culture negative; on 10th day positive. The organism from this specimen showed rapid

and high agglutinating properties, being completely agglutinated in 1-16,000 dilution, incubation 30 minutes. The milker's serum agglutinated this organism up to 1-160.

#### SUMMARY

The offending organism was recovered from the blood in 4 of the 6 cases tested, and once from the feces in 4 during active stage of the disease. Four of these were confirmed by blood culture. The

Widals in these were, 2 negative, and 2 positive in 1-40 dilution, only, there not having been sufficient time for the patients to develop specific agglutinins. The organisms from the blood were proved to be *B. typhosus* on sugars and by agglutination with anti-serums. The earliest positive blood culture was 6 days after onset of symptoms, emphasizing the value of such cultures in early typhoid bacteremia.

## THE STOLTENBERG DIFFERENTIAL STAIN FOR DIPHTHERIA BACILLI

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A DIFFERENTIAL stain for diphtheria bacilli, recommended by Stoltenberg,<sup>1</sup> has been compared with Loeffler's alkaline methylene blue stain and Albert's stain for polar bodies.

The results of the three procedures were first studied with pure cultures, the series including 25 cultures of *B. diphtheriae*, 10 of *B. hofmanni*, and 7 of *B. xerosis*. Forms with polar bodies predominated in the cultures stained with Stoltenberg's or Albert's stain, whereas the predominating forms stained by Loeffler's method were solid or banded. No difference was noted in the morphology of *B. hofmanni* when stained by the three methods; all were solid or banded forms and no granules were observed. The cultures of *B. xerosis* showed forms with polar bodies as well as banded and solid forms with all three stains.

One hundred nose and throat cultures received for routine examination were stained by the three methods and morphologically characteristic diphtheria

bacilli were found in 45 with all of the stains. It was noted that young cultures of *B. diphtheriae* (incubated at 37° C. for from 6 to 12 hours), which with Loeffler's stain appeared as solid or banded forms, showed polar bodies with Stoltenberg's stain. The same cultures incubated for 24 to 48 hours showed polar bodies when stained with Loeffler's alkaline methylene blue. The morphology of *B. hofmanni* remained unchanged throughout the long incubation period and these organisms were so faintly stained that *B. diphtheriae* could be easily differentiated.

The formula and procedure for Stoltenberg's stain are as follows:

Malachite green	0.250 gm.
Toluidin blue	0.050 gm.
Haematoxylin or logwood extract	0.010 gm.
Distilled water	100.0 c.c.
Acetic acid	3.0 c.c.
Ethyl alcohol	3.0 c.c.

Stain for 1 minute. Then wash the preparations with tap water and dry. The granules appear red and the body green.

The stain is not recommended as a substitute for Loeffler's alkaline methylene blue stain for routine use as it does not as satisfactorily differentiate *B. diphtheriae* from *B. xerosis*, and other non-pathogenic forms with polar staining. It is recommended as a valuable confirmatory stain, however, since it aids in the differentiation of *B. diphtheriae*

from *B. hofmanni*, especially in young cultures, and is a very short and simple procedure.

## REFERENCES

1. Stoltenberg. Neue Farblösung für Diphtheriebazillen, besonders für Körnchenfärbung, *Deutsche med. Wchnschr.*, 52: 1304, 1926.
2. Wadsworth, A. B. Standard Methods of the Division of Laboratories and Research of the New York State Department of Health, 1927, pp. 16, 19, 24, 27, Williams & Wilkins.

## VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

**Tuberculosis in Early Childhood**  
—This survey included the total deaths from tuberculosis in England and Wales for 1927. The period especially studied was the first 5 years of life, and the amount of tuberculous disease in all its forms at this time was compared with similar succeeding periods. The number of deaths, about 3,000 in the first period, birth to 5 years, exceeded that in the later period of childhood and puberty. In adolescence and throughout the prime of life, the figures were about or exceeded the 4,000 mark. The first phase of tuberculosis is therefore, as regards fatal disease, easily the most important of the whole period of childhood.

The relative prevalence of clinical types of tuberculosis was also studied, through the medium of the tuberculosis deaths in England and Wales for 1927. Only 3 types were chosen, meningeal, respiratory and abdominal. These do not constitute the whole of tuberculosis at the early period in childhood, but form the greatest and most important part of it. Meningitis easily took first place in the number of deaths for the first 5 years; and the total for this period was far greater than for any other period. Abdominal tuberculosis

also caused far more deaths at this period than at any later period. The number of deaths from pulmonary tuberculosis practically equalled that from abdominal tuberculosis in the first period. In the first 5 years of life, in England and Wales, the deaths from tuberculous meningitis were 3 times greater than those from pulmonary and from abdominal tuberculosis.

A study of 254 cases of tuberculosis admitted to the Royal Edinburgh Hospital for Sick Children during the past 8 years showed that 181 cases occurred under 5 years of age. Of the 91 cases of meningeal tuberculosis, 73 occurred under 5 years. Death resulted in all cases. Post-mortem examination was made in 51 cases and the primary lesion revealed in all but 2. In this group of 181, there were 27 cases of pulmonary tuberculosis with 19 deaths. Pulmonary tuberculosis is very difficult to diagnose in the period of infancy because it assumes a variety of forms. In the first 5 years, there were 81 cases of abdominal tuberculosis with 43 deaths. Throughout northern England and Scotland; abdominal tuberculosis is a grave peril, being caused by infected milk in most cases.—*Brit. M. J.*, 2: 655-658 (Oct. 12), 1929.

## VITAL STATISTICS FOR 1929

*Metropolitan Life Insurance Co.*—Continued progress of the American and Canadian public health movement is shown in the mortality records for nearly 19,000,000 industrial policy holders of the Metropolitan Life Insurance Company during 1929. There occurred 8.7 deaths per 1,000 lives, a figure identical with that for 1928. The outstanding public health fact of 1929 was the reduction of the tuberculosis death rate to a new minimum. The death rate now stands at 85.6 per 100,000. The previous low point was 90.6, recorded in 1928. The outlook at the present time is that the downward swing of the death rate will continue, and 10 years from now the tuberculosis death rate among these wage earners will be well on its way toward 40 deaths per 100,000.

Another new low point was reached in 1929, in the mortality rate for typhoid fever. The death rate (2.3 per 100,000) marks a decline since 1911 of 89.9 per cent.

The death rate for the four principal communicable diseases of childhood (measles, scarlet fever, whooping cough and diphtheria) in 1929 was only 16.3 per 100,000, or 14.2 per cent below the previous minimum of 19.0, recorded in 1928. The outstanding item in this group is diphtheria, with a 1929 death rate of only 8.5 per 100,000, as compared with 9.5 (the previous minimum) in 1928. Scarlet fever duplicated its minimum death rate of 1928 (2.6 per 100,000). There was a small rise in the mortality from whooping cough.

The death rate for diarrhea and enteritis reflects closely the advancing standards of domestic and civic hygiene. The mortality rate for this cause has now declined to 7.8 per 100,000—or almost to one-quarter of the figure registered 18 years ago.

One of the most encouraging developments in 1929 was the recording of a new minimum death rate for diseases and conditions incidental to pregnancy and childbirth. The rate, 13.5 per 100,000, was lower by 4.9 per cent than the previous minimum of 14.2 in 1928.

The suicide death rate of these insured wage earners was 8.5 per 100,000 in 1929, which is identical with that for 1928, but higher than for any other year since 1917. The homicide death rate declined slightly.

For certain diseases and conditions the 1929 mortality record was somewhat unfavorable. The early months of the year experienced the heavier part of the wave of influenza and pneumonia which began in November of the preceding year. The heart disease death rate, in 1929, was 146.1 per 100,000 as compared with 144.4, the previous maximum, in 1928. The rise in the rate for cardiac conditions in 1929 is chargeable almost entirely to the effects of the influenza epidemic, which hastened the deaths of many thousands of persons suffering with chronic diseases.

The cancer death rate continued its slow, persistent increase to a new high point. The 1929 mortality rate was 77.3 deaths per 100,000 policy holders as compared with 77.0 in 1928. The most recent investigation into cancer mortality by the Metropolitan Life Insurance Company has developed certain important aspects of the upward trend of the death rate, and has shown that the gravity of the cancer problem is much greater than it was only 5 years ago.

The previous maximum death rate for diabetes was 17.9 in 1928, and the rise in 1929 amounted to 2 per cent. The diabetes mortality rate has now been increasing continuously for 5 years.

The mortality rate for accidents rose

slightly in 1929. This was due almost entirely to the alarming increase in automobile fatalities, although there were also more deaths than in the preceding year from falls and machinery accidents. The 1929 death rate for automobile accidents was 20.9 per 100,000, a rise of 12 per cent in a single year.

Acute and chronic alcoholism caused 641 deaths of policy holders during 1929, with a death rate of 3.4 per 100,000. This marks a slight increase over the record of 1928 when there were 599 deaths and a death rate of 3.3 per 100,000. Deaths from cirrhosis of the liver, which are largely of alcoholic origin, number 1,208 in 1929, as compared with 1,217 in 1928; the death rate declined to 6.5 per 100,000, from 6.7, in 1928.

The latest available mortality figures for the general population of the United States relate to the year 1928. Between 1911 and 1928 the death rate for the general population declined only 11 per cent, as compared with a drop of 31 per cent among Metropolitan industrial policy holders. In 1928, the crude mortality rate of insured wage earners was lower than that of the general population (of comparable ages) by 3.2 per cent.

For the communicable diseases of childhood, the corresponding figures are 68 per cent for insured wage earners and 62 per cent for the general population. The greater improvement which has obtained since 1911 in the death rate among Metropolitan industrial policy holders, as compared with the general population, has come largely from the company's activities in the fields of social service and public health among the many millions of insured people.—New Low Records for Mortality in 1929, *Stat. Bull.*, 11: 1-10 (Jan.), 1930.

*Milwaukee, Wis.*—Health conditions in the city of Milwaukee were on the

whole very satisfactory, in spite of the fact of the influenza epidemic and the most severe measles epidemic in the history of the Health Department. The general death rate for the year was 10.5 compared to 10.9 for the previous year, and was somewhat lower than the average for the last 5 years. Infant mortality was 72 per 1,000 live births compared with 70 for 1928. The principal cause of deaths in babies over 30 days old was pneumonia, 162 babies dying from this cause during 1929. There were 886 infant deaths under 1 year, 12,232 live births and 327 stillbirths, compared to 846 infant deaths under 1 year, 12,120 live births and 375 stillbirths in 1928. There were 13,198 cases of measles with 25 deaths reported during the year. Whooping cough showed the next greatest increase with 3,806 cases and 40 deaths. All other contagious diseases showed decreases. Tuberculosis with 259 deaths showed an encouraging decrease over 1928 with 292 deaths. Heart disease and cancer showed the usual increase; there were 1,087 deaths from heart disease compared to 997 the preceding year, and 591 deaths from cancer compared to 578 the year before. There were 108 automobile deaths compared to 124 for last year. Deaths from alcoholism increased from 21 in 1928 to 27 in 1929. There were 5 deaths due to carbon monoxide poisoning.—*Milwaukee Month. Health Bull.*, 19: 2-5 (Feb.), 1930.

*New Haven, Conn.*—The estimated population of New Haven for 1929 was 190,847. During the year, there were 2,181 deaths, giving a death rate of 11.4. The most striking feature was the marked reduction in the infant mortality from 53 in 1928 to 42.4 in 1929. The birth rate dropped again to a new low point of 14.6. Among the 10 leading causes of death, heart disease still held the lead; tuberculosis was in 5th



place, and deaths from auto accidents ranked 8th. The tuberculosis death rate of 49.25 showed a substantial drop from the previous year. There were 6 resident cases of smallpox during the year. The substantial control of diphtheria was striking. There was 1 less case in 1929 than in 1928, and there were only 2 resident deaths as against 6 for the previous year.—*New Haven Month. Health Bull.*, 57: 2-7 (Jan.), 1930.

*Victoria, British Columbia*—The population of Victoria according to the 1928 census was 43,750. The death rate for 1929 was 13.1 per 1,000 population as against 13.9 for the preceding year. The birth rate was 18.1 for 1929 and 20.1 for 1928. Infant mortality decreased from 42.2 per 1,000 live births in 1928 to 40.3 in 1929. The latter was 37.9 for whites and 72.7 for Asiatics. With the exception of a somewhat greater summer incidence of measles and mumps, 1929 was light in communicable diseases. There were 57 cases of pulmonary tuberculosis with 25 deaths.—*Annual Report for 1929*.

*Lincoln, Neb.*—A study of the mortality records for 1929 shows an increase of 43 deaths over the previous year, 29 of which are accounted for by an increase of organic heart disease. Deaths from nephritis show a decrease of about 14 per cent. Mortality from malignant disease is about on a level with preceding years. There has been no further decrease in deaths from puerperal infections. The increased mortality has occurred chiefly in the age group 5 to 25, which shows an increase of 55 per cent, and the old age group, 65 and over. There were 25 less births in 1929 than in 1928 and 92 less than in 1927; a decrease of 6.5 per cent in 3 years. There was a much larger proportionate decrease in stillbirths; 34 per cent over the same period.—*Annual Health Report*.

*Buffalo, N. Y.*—Buffalo had an estimated population of 555,800 for 1929. The annual death rate was 13.8 per 1,000 compared with 13.4 in 1928. There were 11,685 births corresponding to a rate of 21.0 per 1,000 against 21.7 in 1928. Infant mortality decreased from 74.0 per 1,000 live births in 1928 to 66.1 in 1929. There were increases in the number of deaths from organic diseases of the heart from 1,335 in 1928 to 1,749 in 1929; cancer, 666 to 678; pneumonia, 419 to 501; automobile fatalities, 150 to 196; diabetes, 97 to 119; and suicides, 61 to 72. Noteworthy among decreases were pulmonary tuberculosis, 404 to 390 in 1929; other forms of tuberculosis, 90 to 75, and nephritis, 254 to 251. The number of cases of measles declined from 6,502 in 1928 to 975 in 1929.—*Buffalo Month. San. Bull.*, Dec., 1929.

*Boston, Mass.*—The Boston Department of Health announces that the estimated birth rate for 1929 was 22.7 per 1,000 population, as against 23.5 in 1928. The death rate from all causes was 14.5, the same as in 1928. There was an infant mortality rate of 68 per 1,000 live births, as against 77 in 1928. Among the leading causes of death were 2,230 from heart disease, 1,245 from cancer, 1,411 from pneumonia, and 574 from pulmonary tuberculosis.—*Boston Month. Health Bull.*, Jan., 1930.

*Maryland*—During 1929 the birth rate in Maryland was 18.5 per 1,000 population. This is the lowest recorded since 1912. The death rate from all causes for the year was 13.4. There was an infant mortality rate of 79 per 1,000 live births. The rate in Baltimore was 73 and in the counties it was 85. The leading causes of deaths were heart disease with a rate of 233.2 per 100,000 population; influenza and pneumonia with a rate of 178.2; nephritis 148.4; cancer and other malignant tumors 108.3; tuberculosis, all

forms, 104.2; and cerebral hemorrhage 100.3.—*Maryland Month. Bull.*, Feb., 1930.

*Newark, N. J.*—The Health Department of Newark has announced in a preliminary statement that there have been fewer infant deaths, and a reduced mortality from cancer, Bright's disease and nephritis, and puerperal fever in 1929 over the previous year. Both the crude death rate, 11.6, and the adjusted rate, 10.9, per 1,000 were the same as in 1928. The infant mortality rate of 60 per 1,000 live births was one of the lowest ever recorded for the city. Deaths from Bright's disease numbered 254, a figure 44 less than the preceding year. The 471 cancer deaths were 20 fewer than in 1928. Puerperal fever caused 16 less deaths, reducing the rate from 13.3 to 9.8 per 100,000. Deaths from heart disease numbered 1,057, or 55 less than in 1928. The death rate from organic heart disease, 220.2 per 100,000 population, was by far the highest of any rate for special causes. Increases in deaths from apoplexy, influenza, tuberculosis, accidents and suicide were noted. Reported cases of communicable diseases decreased 4,036 during the year to a total of 17,329. Fewer cases of measles accounted for most of this reduction.—*New Jersey Pub. Health News*, 15: 57 (Feb. 14), 1930.

*Connecticut*—The accumulated birth rate for 11 months showed a very decided drop from 17.5 in 1928 to 15.2 in

1929. The death rate of 10.9 is the same as it was in 1928, which is encouraging because of the influenza outbreak early in the year. For the 11 months of 1929, decided increases were shown for influenza, cancer, diseases of the heart, and diarrhea under 2 years. Noteworthy among decreases were whooping cough, diphtheria, all forms of tuberculosis, diabetes, nephritis, and puerperal diseases. It now seems as if 1929 will show the lowest death rate from diphtheria in the history of Connecticut vital statistics and it is possible that the death rate from tuberculosis will reach a record low.—*Conn. Month. Health Bull.*, Jan., 1930.

*Infant Mortality in Bombay*—The number of births registered in Bombay in 1928 exceeded that of the previous year by over 2,000; it was more than 3,000 above the annual mean number of births registered in the 10 years, 1918–1927. Calculated on the estimated population for 1928, the birth rate was equivalent to 18.5 per 1,000; the number of live births recorded was the highest since 1866.

The death rate among infants under 1 year was 311 per 1,000 registered births, a figure which contrasts sharply with the calculated infant death rate of 176 per 1,000 for the whole of British India, but it is an improvement on 316, the 1927 rate, and on 474, the annual average in the decennium 1918–1927.—*Brit. M. J.*, 2: 1082 (Dec. 7), 1929.

# PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

**Sewage Disposal. The Activated Sludge Process in Operation. Standards of Purity**—The activated sludge process is far more likely to supplement than to supersede the older methods. Common mistakes made in connection with its use and the wisdom of not dispensing with filters are considered. It has been found that the purification effected by the activated sludge process is at first very rapid, but it soon slows down, e.g., 60 per cent of the impurities of the Birmingham sewage are removed in the first hour, but it takes 5 hours to remove another 30 per cent.

The quantity of sewage purified by each cu. yd. of filtering material is more than doubled when the sewage has been treated by the activated sludge process instead of merely being passed through a sedimentation tank. Thus, owing to the rapid increase in the population of the drainage district under the Tame and Rea Drainage Board, aeration or flocculation tanks are used between the sedimentation tanks and filters to obviate the necessity of laying down an additional acre of filters each year.

Opinions differ as to the purification standards and nature of tests to be used. Lord Iddesleigh's Commission recommended a common sense standard to be applied in ordinary cases, the dilution afforded by the stream being considered before the application of the standard. With a dilution exceeding 500 volumes, all tests might be dispensed with. No biological standard has been advocated, those proposed or in force relating solely to the chemical qualities of the effluent. The effluent from a sewage works must

therefore be regarded as potentially dangerous.—A. J. Martin, *Surveyor*, 76: 366, 1929. (From Papers of Water Pollution Research Board, England.)

**Artificial Means of Influencing the Formation of Ground Water in Flat Country**—The author considers that it is possible to increase the amount of ground water in a flat country by artificial means at the expense of surface flow-off and evaporation. The seepage of rain through the fine-pored surface layer causes an increase of air pressure in the lower larger-pored stratum, which may increase above the atmospheric pressure and force water to the surface. The author carried out investigations of the growth of this air pressure and of its effect on seepage and the increase of ground water. The pressure in the coarse layer was observed by inserting a pipe carrying a manometer. A method of estimating the amount and increase of ground water is described. It was found that the underground river which flows through Munich only receives some 10 per cent of the precipitation of the district through which it flows. The author suggests that methods for increasing the amount of ground water are: to increase the air drainage in the coarse-pored stratum above the water surface, and to increase the flow of water and the depth of channel. He describes an arrangement for air drainage either by vertical slotted pipes reaching almost through the coarse layer or, if the fine upper layer is thin, by horizontal slotted pipes with vertical pipes to the surface at intervals. This arrangement should be combined with

water intakes (seepage galleries, wells, etc.), and, where necessary for agricultural purposes, with a pressure pipe so that water can be forced to the surface.—Mezger, *Gas- und Wasserfach*, 72: 948, 1929. (From Papers of Water Pollution Research Board, England.)

**Water Supply of Hither Pomerania**—With its scattered population, Hither Pomerania is almost entirely supplied by single wells. The results of 50 bacteriological and 360 chemical investigations of well waters are summarized; of these 90 per cent were chemically and bacteriologically to be condemned. Of 33 samples of water from dairies, 21 were bacteriologically impure and only 5 were chemically acceptable. Of 16 school well waters, 14 were to be condemned. Of 50 bacteriological tests, 15 were usable, 3 usable under certain conditions, and 32 unusable.

The true underground water in Pomerania lies some 40 meters deep between glacial deposits. Most wells only reach a "surface" underground water, above the latest glacial deposit, which is not cut off from pollution by sewage, etc. Also the building of wells is generally bad. Water supplies for drinking purposes should be taken from the second ground water zone or from one deeper still.—Lensden, F. P., *Z. f. Medizinalbeamte*, 1929, 42, 40; *Gas- u. Wasserfach*, 1929, 72, 960. (From Papers of Water Pollution Research Board, England.)

**Sewage Disposal. Johannesburg's New Sludge Digester**—This account is taken from a paper contributed to the South African Institution of Engineers by E. J. Hamlin. The new type of digester unit adopted by the Johannesburg Council consists of a flat-bottomed cylindrical tank with steel superstructure carrying the mechanism and driving unit

and supporting the gas collecting tank cover. A central vertical revolving shaft carries horizontal radial arms near the surface which distribute the feed and break up the scum and, at the lower end, radial arms, to stir the sludge and move it toward the discharge cone, and a scraper in the discharge cone. Excess liquor runs off through an opening in the tank wall. The advantages of mechanical operation are said to be reduction in tank volume, even discharge of gas, and assurance of a completely digested sludge. The amount of gas is calculated at  $\frac{1}{2}$ – $\frac{3}{4}$  cu. ft. per head per day.—*South African Eng.*, 40: 193, 1929. (From Papers of Water Pollution Research Board, England.)

**The Fertilizing Value of Sewage Sludge**—The fertilizing value of sewage sludge depends upon the percentage of available phosphoric acid, total nitrogen, and water-soluble potash. As fertilizers, sewage sludge appears to be divided into two distinct groups: one, sludge from Imhoff tanks and similar processes, and the other that from activated sludge processes. In the Imhoff tanks, where fermentation in the absence of air takes place, the sludge goes through an extensive decomposition, leaving only the more resistant portions. The nitrogen in these more resistant portions, to be taken up by plants, must be decomposed by soil bacteria. These facts indicate why this type of sludge has not proved to be such a good fertilizer as that from the activated sludge process. Sludge from an activated plant is easily decomposed by soil bacteria and has a good availability. Of course, all activated sludge is not of equal value, because some may contain nitrogenous compounds of lower activity, which will decrease the availability of nitrogen.

Comparative analyses of two types of sludge, dried to about 4–8 per cent water, follow:

	Imhoff per cent	Activated per cent
Phosphoric acid	0.47-2.48	2.41-2.68
Nitrogen	0.88-2.99	3.69-5.54
Potash	0.2-1.44	————

Based on these figures, the retail fertilizer value of the Imhoff sludge would be about \$6.55 and that of the activated about \$22.65.—G. S. Fraps, *Proc. Eleventh Texas Water Works Short School*, Jan., 1929, pp. 150-152.

**A Study of Lead Poisoning in a Storage Battery Plant**—This study was a sanitary survey made of a small plant, of 56 employees, devoted to the manufacture of storage batteries. Air analyses were made of the various rooms where the employees worked. In only one of the six working rooms was the air free from lead. The amount of lead found was from 0.009 mg. per cu. ft. of air to 0.0453 mg.

Workers from each of the above rooms were studied and the clinical findings were recorded for each group. These data indicate that the greatest exposure existed in the assembly room, where 7 of 10 men examined showed positive lead poisoning. This high rate is due to the finely divided state of lead encountered by the working men.

The study revealed that workers exposed to 0.009 mg. of lead per cu. ft. for a period of 1½ years are not affected with chronic lead poisoning. However, if the duration of exposure is continued for 2½ years, chronic lead poisoning develops. Necessary changes in mechanical equipment and operation are suggested in order to minimize the lead dust hazard.—Leonard Greenburg, A. A. Schaye and H. Shlionspy, *Pub. Health Rep.*, 44, 28: 1666-1698 (July 12), 1929. Abstr. M. S. Foreman.

**Mastitis—Raw Milk Combination Causes Another Epidemic**—Following an outbreak of approximately 75

cases of mastitis in Savannah, Wayne County, N. Y., which has a population of about 600, an investigation revealed all cases investigated had used a Grade A raw milk from one dairy. Further investigation showed that one cow in the herd had received an udder injury about March 2, that a veterinarian reported no inflammation on March 6, that mastitis was discovered on March 13, and the milk not excluded until after that date.

The department's position is stated as follows: (1) that acute mastitis is a serious health menace; (2) dependency on the farmer for discovery and action is unsatisfactory; (3) monthly veterinary inspection or weekly bacterial examination of the milk or both provide a safeguard although not an entire one; (4) certain safeguard is effective pasteurization.—Anon., *Health News*, New York State Dept. of Health, 6, 13: 49 (April 1), 1929. Abstr. F. O. A. Almquist.

**Pre-Determining the Extent of a Sewage Field in Sea Water**—A description of a method of pre-determining the probable area and extent of a sewage field in sea water, given the quantity of sewage flow and the direction and depth of discharge. The behavior of fresh water jets in sea water was first studied, and experiments were afterward instituted in a basin of some 2 acres in extent in Los Angeles Harbor.

Fresh water colored with eosin Y was discharged into the basin from a tank on a raft; the underwater process was watched by reflection and the dilution measured by comparison with measured dilutions of the tank water. Experiments were made with vertical jets (downward and upward), horizontal jets, jets discharging upwards at 45°, and multiple jets.

Equations are given for determining the dilution of a discharge with a probable error of 4-5 per cent. Corroborations

tion and correction of the method from observations in practice are discussed and examples of its application given.—A. M. Rawes and H. K. Palmer, *Proc. Am. Soc. Civil Eng.*, 55: 1167, 1925 and 2221, 1929.

**Technical Aspects of the Prevention of Pollution of Rivers by Domestic Sewage and Trade Wastes**—Questions relating to the pollution of rivers, such as standards for effluents, methods of purifying domestic sewage, pollution by storm overflows, the activated sludge process, sludge disposal, trade wastes, laws governing the admission of trade wastes into sewers, the problem of spent gas liquor, financial difficulties militating against sewage treatment, and disposal by dilution, are discussed in outline. The author sums up as follows:

Any domestic sewage, and the large majority of trade wastes, can be purified—at a cost. The engineer is ready to do his part; the river, if given a chance, will complete the work. The chief hindrances to the purification of rivers are not technical, but financial, legislative and administrative.

—Arthur J. Martin, *J. Roy. San. Inst.*, 49, 12: 677–686 (June), 1929. Abstr. A. W. Fuchs.

**Sewage Plants and Mosquito Propagation**—Investigation of 42 sewage treatment plants in Bergen County, N. J., showed that 18 were directly responsible for mosquito breeding. Four examples are given: (1) An Imhoff tank sprinkling filter effluent discharging to a creek bottom, causing overflow to seven acres of meadow land, and heavy growth of mosquitoes; (2) sewage from a town one and one-half miles above a small lake of 10 to 15 acres caused mosquito breeding, requiring drainage of lake for control; (3) sewage plant effluent pooled on open meadow of three or four acres caused heavy breeding; (4) sewage plant efflu-

ent runs 1,500 feet through pipe to tide water. At high tide effluent backs up and overflows, spreading 1,000 feet on each side of pipe in cattails on low land, causing growth of mosquitoes.—John P. Peterson, *Munic. News & Water Works*, 76, 7: 288 (July), 1929. Abstr. E. A. Reinke.

**On the Nature and Removal of Effluents from the Brown Coal Industry**—Briquet water requires only mechanical purification though precipitation is necessary when the water is very acid. Effluents from the briquetting furnace contain nitrogen, sulphur, and carbon-oxygen compounds. The condensate contains carbon compounds in the form of alcohols, aldehydes, ketones, acetic acid and phenols. In contrast to hard coal, there are mainly present cresol or creosote, hydroquinone, resorcin, pyrogallol, and phloroglucin, all of which, in the presence of water and alkali, form resins. These effluents are very harmful to animal and plant life. The modern carbonization ovens give rise to large quantities of effluent containing 0.1–0.2 per cent of nitrogen (90 per cent as ammonia) and 0.4–0.8 per cent of phenol. Rotary generators give a very concentrated and harmful effluent. In the production of crude gas from briquets, an effluent is produced like that from the carbonization oven. Evaporation of this effluent is only economically possible when waste heat can be used. De-phenolizing is only economically possible when the content is over 2 gm. per litre. Biological processes are expensive and the lack of domestic sewage in brown coal districts makes them impossible. Only physical-chemical processes remain. Filtration through ashes has given good results and phenol can be recovered by absorption by activated carbon.—H. Stoeff, *Z. angew. Chem.*, 42, 29: 783, 1929. (Papers of Water Pollution Research Board, England.)

# INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

**Lead Poisoning**—The compounds of lead alone are poisonous, the handling of metallic lead and its compounds being harmless in the absence of dust. Two mg., i.e., 1/32 gr., absorbed daily will in time undermine the constitution and set up chronic lead poisoning with changes in the kidneys and arteries which will shorten life.

Industrial lead poisoning is entirely due to inhalation of leady dust or fume and not at all to handling. Absorption takes place far more generally through the lungs than through the alimentary canal. In its prevention, influences brought to bear external to the workman over which he can exercise no control, bring about the most brilliant successes in handling lead poisoning. Failure and disappointment result where this principle has not been applied as in lead smelting works, electrical accumulator factories and in house painting.

The essential thing in the decrease of poisoning in white lead works has been the discovery that the carbonate of lead has much greater affinity for oil than for water. In pottery manufacture, the drop has been due to the decreased solubility of the form of lead glaze used. The fall in the manufacture of paints and colors has been due mainly to locally applied exhaust ventilation. In the other industries mentioned above, failure to prevent lead poisoning is due to the fact that no method of cutting out the personal element has been universally applicable. Yet in one accumulator factory employing about 1,000 persons in contact with lead and in which there were 11 cases of poisoning in 1926 and 18 in 1927, after the engagement of a whole-time works sur-

geon to study the men in the work there were no cases reported in 1928 and none up to July, 1929.

The fall in coach painting is due to the absence of white lead in the paint, largely owing to the enormous development of spray painting of motor cars, etc., in which employers are too sensible and too frightened to use lead compounds as an ingredient of cellulose sprays. The substitution of zinc base and titanium oxide in the internal painting of buildings has resulted in a decrease of lead poisoning among house painters. In France one is impressed with the much more beautiful effects and brighter colors of their buildings with none of the dirty drab color characteristic of white lead after a short exposure to the atmosphere.

The reason that the proportion of deaths to cases is relatively so much higher in the pottery industry and house painting than in others is not that they are so much more dangerous, but because workers engage in them for longer periods and become the victims of chronic lead poisoning with its sequela of saturnism, such as Bright's disease or cerebral apoplexy, both of which are compensable under the Workmen's Compensation Law.

Figures show that females are attacked by lead poisoning about twice as frequently as males. They suffer more from headache and brain symptoms, while there is no doubt as to the baleful influence of lead on uterine function, and because of the last, employment in lead should be barred where there is interference with the function of maternity.

Most cases of lead colic occur within

the first two years of employment, while paralysis (wrist drop) is always a late symptom and is more frequent in men because their duration of employment in lead exposure is much the longer. A Recommendation of the General Conference of the International Labor Organization held in Washington, in 1919, urged that

In view of the dangers involved to the function of maternity, and to the physical development of women, and young persons under the age of 18 years, they should be excluded from employment in the following processes.

These are, in brief, concerned with the reduction of zinc or lead ores, the desilvering of lead, the melting of lead or old zinc, the manufacture of solder or alloys containing more than 10 per cent of lead, the manufacture of various lead compounds (named) which are used in paints and glazes, and work upon electric accumulators.

It is further recommended: The employment of women and young persons under the age of 18 years in processes involving the use of lead compounds be permitted only subject to the following conditions

(named), in regard to working conditions, notification, compensation, medical examination, protective clothing, eating places, etc. These points have been embodied in the "Women and Young Persons Act, 1920."

At the present time in this country (England and Wales) lead poisoning cases are twice as severe and the amount of chronic poisoning four times as great among house painters as among factory workers, yet there is little evidence that male lead workers are less likely to beget children although there are so many variables to consider in a question of this sort that a definite conclusion is difficult.

An analysis of 10,923 cases of lead poisoning in the past 30 years has brought out certain essential facts such as the reduction in severity and in the number of chronic cases, and conse-

quential increase in the moderate and slight attacks. Reduction in severe cerebral symptoms is very important since these must be regarded as due to lead dust or fume. It was the cases of convulsions and blindness in quite young girls 30 years ago which agitated the public mind. Epilepsy, mental defect, and optic neuritis as symptoms of lead poisoning have decreased, in some cases remarkably.

Among 6,499 cases of lead poisoning were 680 of paralysis and 603 of muscular weakness. The right forearm is shown to be considerably more affected than the left in both paralysis and weakness. The testing of the strength of grasp and of the fingers and wrists is "the most useful single test there is for detecting chronic lead absorption rapidly." Another most remarkable feature is the wrist drop consequent upon the selective toxic action of lead on the musculo-spiral nerve.

An accompanying chart shows that the chief paralyses and weaknesses involve, in descending order: (1) both forearms, (2) the right forearm in respect to paralysis but the arms and legs together in respect to weakness, (3) the left forearm alone in both conditions, and (4) the arms, legs, fingers, etc. (The author next pokes fun at "the great ethyl petrol stunt" which used the time and attention of 11 experts from April 2 to July 16, 1928, in coming to the unanimous conclusion "that there were no reasons for prohibiting the use of ethyl petrol." Not a single case of lead poisoning from this substance has been reported in the country.

Lead poisoning can only be prevented; it cannot be cured. Symptoms can be treated and relieved. While saying this I am not unmindful of the undoubted progress that has been made recently of how lead acts when absorbed into the system by Drs. Aub, Fairhall, Minot and Reznikoff working in the Harvard School of Public Health.

Their experiments proved that lead en-



ters the organism most rapidly by the respiratory tract; hence inhalation of lead or its compounds in the finely divided state is to be most guarded against.

Analysis of reports on 10,929 cases of lead poisoning shows in general the following: *severe* cases have included paralysis, encephalopathic conditions—convulsions and mental affections, and grave undermining of the constitution associated with Bright's disease and arteriosclerosis; *moderate* cases have included: a combination of colic with anemic, profound anemia, partial paralysis, and cases in which there is constitutional debility; while *slight* cases have included colic, constipation and rheumatic pains, anemia, and either of the above with muscular weakness.

Accompanying tables, as already stated, show a noticeable decline in severity of cases in the last 5-year period as compared with the first 2; brain symptoms are distinctly fewer; cases of paralysis fewer than they used to be (which general statement also applies to "weakness of the arms").

The tables show also the percentage by sex of such main symptoms as: "gastric, anemia, headache, paretic, encephalopathy, rheumatic, and other," divided into four 5-year periods, 1900-1924 inclusive.—Sir Thomas Morison Legge, late H. M. Senior Medical Inspector of Factories (England and Wales), *J. Roy. Soc. Arts*, LXXVII, 4007: 1023-1039 (Sept. 6), 1929.

**Occupational Diseases in 1929 Show Lead Poisoning Led in Fatalities**—This is a preliminary summary of 1,381 occupational disease claims filed with the Industrial Commission of Ohio for the year 1929. These claims, of course, have not all been allowed and some of them have been proved not to be occupational diseases. In the total were 78 claims for

tenosynovitis which was not on the list of compensable diseases during 1928. Also, 102 claims were for afflictions not on the compensable schedule, leaving 1,279 to be considered by the commission for payments.

Of 37 death claims, 9 more than for the year 1928, 10 were for non-compensable diseases and the remaining were for the following: dermatitis 3, lead poisoning 19, benzol or derivatives 2, anilin poisoning 1, volatile petroleum products such as benzine or naphtha 2.

There was a total of 911 claims for occupational skin diseases which, exclusive of the 3 death claims, had an average period disability of 11 days each. There was a total of 189 claims for lead poisoning for which, deducting the 19 death claims, the average number of days lost per claim was 33. There were also 61 claims for compressed air illness.

In the group of 102 non-compensable claims there were 30 cases of tuberculosis, 13 asthma, 21 bronchitis, 6 poisonings, 11 infections or contagions, 10 inflammatory conditions, 5 various forms of neuritis, and 4 arthritis, with 2 not classified. [A considerable number of the claims for lung conditions were found to be due to silicosis and other forms of pneumokoniosis according to the records of the same cases which were investigated by the State Department of Health.—E. R. H.]—Unsigned, Ohio Industrial Commission Monitor, 3, 2: 303 (Feb.), 1930.

**New Rule Applying to Minors Employed in Spray Coating Operations**—The following rule was adopted by the Industrial Board of the State of Pennsylvania at its meeting on October 16, 1929:

No person under 18 years of age shall be required or permitted to spray coat objects with any substances containing lead, benzol, or ground siliceous material.—

*Labor & Industry*, Pa. Dept. of Lab. & Ind., Harrisburg, XVI, 11: 5 (Nov.), 1929.

**Laboratory Facilities to Assist Industry**—The facilities of the laboratory and technical service of the Connecticut State Department of Health are offered to industries of that state for the determination of gases, dust, fumes, and toxic materials; air velocity, temperatures, humidity, ventilation, or any conditions or processes affecting the health of employees.

A number of studies have already been made for industries doing sand blasting, such as the determination of the efficiency of the protective devices provided and practical suggestions to decrease the dust hazard to the workers exposed. Studies of causes and methods of prevention of dermatitis have been made as well as studies of other environmental working conditions.—Division of Industrial Hygiene, *Connecticut Health Bull.*, 44, 1: 20 (Jan.), 1930.

**Compensable Occupational Disease Institute**—This course was planned to meet the need for definite information about occupational diseases included in the New Jersey Compensation Law. It was also conducted for industrial managers and physicians. The subjects were arranged for Tuesday evening each week for 5 weeks to consist of lectures with illustrations, followed by round table discussions.

The first lecture considered Industrial Poisons, Dr. Harrison S. Martland introducing the subject and discussing the effects, and the Hon. John Roach discussing the Act relating to Industrial Diseases.

The second week included a lecture on Lead Poisoning by Dr. G. H. Gehrmann, of the E. I. duPont de Nemours & Company and by Dr. A. J. Lanza, Assistant Medical Director of the Metropolitan Life Insurance Company, and a

lecture on Carbon Monoxide Poisoning by Dr. May R. Mayer of the New York Department of Labor.

The third week's lecture considered Benzol Poisoning, presented by Dr. Leonard Greenburg of Yale University and Dr. H. F. Smyth of the University of Pennsylvania.

The fourth week considered Anthrax by Dr. Elizabeth B. Bricker of the Pennsylvania Department of Labor and Industry, and Chrome Poisoning by Dr. J. J. Bloomfield of the U. S. Public Health Service.

The fifth week comprised a lecture on Mercury Poisoning by Dr. Henry H. Kessler, Director of the New Jersey Occupational Disease Clinic, and a lecture on Wood Alcohol by Dr. R. H. Price of the E. I. duPont de Nemours & Company.—Newark Safety Council, Department of Labor, Occupational Disease Clinic, and the Essex County Medical Society (New Jersey), Feb. 11–Mar. 11, 1930.

**Small Arms Ammunition**—General information concerning the manufacture of cartridges and shells for rifles, shotguns, and similar small arms is discussed in this bulletin, including a brief review of the personnel and regulations in one of the government arsenals, as well as in two large private industries. There is also a classification of some 20 "Jobs" or industrial processes in the manufacture of powder, shells, bullets, shot, loading, reclaiming, testing, plating, detonating mixtures, and primers.

Dr. Carey P. McCord discusses the potential health hazards in the various processes in which several thousand persons are concerned.—*Industry Rep.*, V, 1: 1–12 (Jan.), 1930.

**Industrial Medicine**—Bernardino Ramazzini, in the years near 1690, laid the foundations of industrial medicine and has become its patron saint. In his "Diseases of Artificers and Trades-

men," published in 1700, he considered in 43 chapters the occupational ills of many types of tradesmen and even some of the professions. At that time there was, comparatively, a small number of dangerous chemicals but he described them with surprising insight.

Today the complex chemical intoxicants are so numerous that they may not even be enumerated. Said Ramazzini:

If we consider what a vast difference there is between the Europeans and the Americans, and other barbarous nations of the New World, we can't but be sensible that mechanik arts have contributed very much towards the civilizing of mankind.

Today, the foremost objectives of industrial medicine are:

1. To fit every person to types and quantities of work according to his ability, and without injury to himself or fellow workmen, and with profit to all concerned
2. To maintain fitness for work both as respects the individual and his environment
3. To educate the worker, particularly in personal hygiene and accident prevention.
4. To reduce absenteeism in any way related to health

Medical care of entire communities in mining areas or kindred enterprises, through contract arrangements, with the family as the unit, may lead to organized or socialized medical care, but it is not within the scope of industrial medicine. The layman's activity to turn the bad by-products of human impairment in industry into profit succeeds only when he does so through skilled industrial physicians. Industrial medicine should be neither purely "fraternal" nor "paternal." It must deal with the worker as a producing unit and not as a social unit. It centers about the factory and not the home. Its activities partake of the practice of both public health and curative medicine, and it deals with workers as individuals and in groups. Essentially conceived in selfishness, industrial medicine culminates in humanitarianism.

The need is great for organized medicine (1) to mark the just and proper domain of acceptable industrial medicine, (2) to stimu-

late a demand for the truly qualified industrial physician, and (3) to limit industrial medicine wholly to the boundaries set forth. If industrial medicine becomes merely a pathway to general care of all the sick by poorly educated, low salaried medical "hacks" it will defeat the very need by which it came into being.—

Editorial, *J. A. M. A.*, 94, 1: 33-34 (Jan. 4), 1930.

**Western Electric Company Experiment**—During the past two years, Elton Mayo and officials of the Hawthorne Works of the Western Electric Company in Chicago have been conducting experimental investigations of rest periods, working conditions, and other influences affecting workers. The investigators showed, at least tentatively, and in highly mechanized and repetitive operations, that—

1. Total daily output is increased by rest periods and not decreased.
2. The conditions of work during the working day have more effect on production than the number of working days in the week.
3. "Outside" influences, i.e., conditions not directly relevant to the task, tend to create either a buoyant or depressed spirit which is reflected in production. A distinct relationship is apparent between the emotional status of the workers and the consistency of their output.
4. The method of the supervisor is the most important single "outside" influence. Home conditions may affect the worker and his work; and a supervisor who can "listen" and not "talk" can in many instances almost completely compensate for such depressing influences.
5. Pay incentives do not stimulate production if other working conditions are wrong.

The most important and significant result is that dealing with the method of supervision. It was found that "bully-ragging" methods of supervision not only depressed workers but their production. It was found that workers came to increase their liking for their jobs with the new kind of supervision which substituted sympathetic "listening" for officious "talking," with a consequent increase of production.—*The Human Factor*, VI, 1 (Jan.), 1930.

# FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

**The Effect of Cod Liver Oil Feeding on the Calcium and Phosphorus Content of Cows' Milk**—While it has been definitely shown that the vitamin D content of the cow's milk can be increased by appropriate feeding and sunlight and that the retention of calcium and phosphorus is improved, the reports are conflicting as to the effect on the quantity of calcium and phosphorus in the milk and their relationship. In the course of investigations which have been lately reported, an opportunity was afforded to analyze milk for calcium and phosphorus during certain test feeding periods.

Short-horn cows were given a maintenance ration of hay and sugar pulp and a milk production ration consisting of various meals, corn and oats so that 3½ lb. of the mixture contained 2½ lb. of starch equivalent and 0.6 lb. protein equivalent. With this diet the milk of each animal remained unchanged for 4 or 5 months.

The experiment consisted of 6 periods: (1) normal diet; (2) 0.5 oz. olive oil per 3.5 lb. portion ration mixture fed; (3) 1 oz. olive oil per 3.5 lb. portion ration mixture fed; (4) 1 oz. cod liver oil per 3.5 lb. portion ration mixture fed; (5) 1 oz. olive oil per 3.5 lb. portion ration mixture fed; (6) normal.

Daily determinations of calcium in the milk were made and phosphorus determinations for each period on daily aliquots. The figures show no change in the percentage of calcium and phosphorus in the milk when cod liver oil is substituted for olive oil and neither oil effected a change over the normal diet. While daily fluctuations in calcium were

noted the total for the period for each cow was the same, and this with a constant milk yield over the period.

It was noted that the addition of cod liver oil materially reduced the percentage of fat in the milk.—Edmond John Sheehy and Brendan Joseph Senior, *Biochem. J.*, 23: 898, 1929.

**The Influence of Different Samples of "Casein" on Vitamin Tests**—Previous work from this laboratory has shown a difference in nutritional characteristics of two commercial varieties of casein (Abstract *A. J. P. H.*, 20: 213, Feb., 1930). This work records direct comparison of two types of commercial casein, "light-white casein" and "vitamin-free casein," designated respectively as "Casein B" and "Casein G." "Light-white casein" contains 2 to 3 per cent of fat which was extracted with alcohol and ether to insure absence of vitamin A. One-half of each of 5 litters of rats was given "Casein B" and the other half "Casein G," vitamin D being supplied with irradiated ergosterol. At the cessation of growth cod liver oil was administered.

The growth curves show the following points: All rats on "Casein B" maintained steady weight and responded to cod liver oil. Two of the litters on "Casein G" grew similarly, indicating the possibility of reserves in the rats or the adequacy of the casein in these two cases. The last 3 litters on "Casein G" did not respond in growth or to the addition of cod liver oil, indicating less reserve factor or inadequacy of the protein. The authors attribute the discrepancy to either the presence of a

heretofore unrecognized factor in one casein or to a different biological property, digestibility or assimilability.

The point is made that in an assay for vitamin A attention should be paid to the source of protein and the present U. S. P. assay for vitamin A is criticized since in the light of this experiment results might be discordant. It is suggested that for comparable results on vitamin A test a standard laboratory material should be agreed upon.

These two types of casein were further tried in vitamin B tests in which the casein, dextrinized rice starch, agar-agar, salt mixture and cod liver oil were used with the rats on screen-bottomed cages. After 11 days of this diet, amounts of dried yeast equal to 2, 5, 8, and 10 per cent respectively in the diet were given with no growth after 10 days.

The "Casein G" in the test diet was substituted by "Casein B," which was shown to be free from vitamins B<sub>1</sub> and B<sub>2</sub>. A control not receiving dried yeast died in 3 days and two rats receiving 5 and 10 per cent dried yeast grew rapidly to 140 and 210 gm. weight. A rat with 8 per cent dried yeast and the "Casein G" diet grew but much less than the one with 5 per cent yeast and "Casein B."

The results were practically duplicated when marmite was used instead of dried yeast. Other experiments indicated that the yeast had its usual vitamin B potency, suggesting that the different results are due to a factor present in one casein and not in the other and that various litters had different reserves of the unknown factor or different powers of utilizing "Casein G."—Katharine Hope Coward, Kathleen Mary Key, Barbara Gwynneth Morgan and Marjorie Camden, *Biochem. J.*, 23: 913, 1929.

**The Epidemiology of Paratyphoid Infections**—A comprehensive resumé of the most recent knowledge of this enteric

group as presented in the Cutter Lecture in Preventive Medicine at the Harvard Medical School on March 28, 1929, forms the basis of this paper. The tangled condition of the nomenclature is discussed and the group classifications limited to a less confusing and workable basis.

Comparison is made of the means available for diagnosis of paratyphoid infections with conclusions that the only sure means of diagnosis is the isolation and identification of the specific bacterium involved rather than dependence upon serological tests. The unreliability of agglutination tests with serum from patients is stressed.

A critical study of the frequency or incidence of paratyphoid infections indicates a far greater proportion of paratyphoid carriers as compared to typhoid carriers than has generally been supposed. It is indicated that from one-fourth to one-half of so-called typhoid fever is really paratyphoid infection. Considerable attention is given to the differentiation of the various types included among the *Salmonella* and the confusion prevailing within this genus due to inadequate differentiation which has given rise to many of our present epidemiological uncertainties with respect to the existence of various "types" or species.

The epidemiology of paratyphoid infection is discussed under the head of specific types that have been fairly definitely implicated in the causation of human illness. The types included in the discussion were *S. paratyphosus* (A), *S. Schottmülleri* (B), *S. aertrycke*, *S. enteritidis*, and *S. cholera-suis*.

There were some types mentioned such as *S. abortivo-equinus* and several bacilli of avian paratyphoid that have not been clearly associated with infection of man.

The main sources of infection by organisms in this group are divided on the basis of human and animal origin. *S.*

*paratyphoid* (A) and Type B *Schottmüller* are given as human parasites with which the lower animals are seldom if ever infected. In contrast to these two types the *aërtrycke*, *cholera-suis* and *enteritidis* strains seem to be primarily related with animal infections. This distinction, however, cannot be drawn too fine as it is known that some of the latter strains can cause disease in animals, give rise to food poisoning as well as occasionally cause active infection in man.

Attention is called to the epidemiologically significant fact that Types A and B commonly display invasive qualities, often entering the blood stream, while the animal paratyphoids are rarely invasive and are important pathologically mainly because of their ability to produce absorbable toxins.

Experimental work on the toxic products of this group of organisms is discussed and attention is given to recent work with heated culture filtrates that were fed to animals for the purpose of reproducing symptoms of "food poisoning." While apparently the toxic filtrates were not materially impaired by heat treatment as indicated by intravenous or intraperitoneal injection into laboratory animals, negative results were obtained when similar material was used in feeding tests.

In discussing the degree of protection afforded by vaccination against infection of the members of this group it was considered probably safe to assume that vaccination with the A and B types gives about the same degree of protection as that conferred by antityphoid vaccination, but there is no reason to suppose that any material protection would be conferred by the addition to so-called triple vaccine of *aërtrycke* and other closely related strains.

The lecture concludes with a review of the most recent knowledge of experimental epidemiology bearing on the spread of paratyphoid infection in man

and animals and discusses the measures likely to be most successful for control of paratyphoid infections of human and animal origin.—Edwin O. Jordan, *J. Prev. Med.*, 3: 279 (July), 1929.

"Food Poisoning" Produced in Monkeys by Feeding Living *Salmonella* Cultures—Rhesus monkeys fed with viable cells of two strains of the *Salmonella* group, *S. aërtrycke*, and *S. enteritidis*, manifested definite and characteristic symptoms of "food poisoning," watery diarrhea, general malaise with, in some cases, loss of appetite. Loss in weight was observed after 2 to 7 days.

Little if any immunity seemed to be produced by one attack of "food poisoning." A second attack could be produced in the same animal after a short interval. Monkeys fed with equivalent amounts of heat killed cultures showed no symptoms. Control feedings of living cells of *B. proteus* and *B. coli* were negative.—G. M. Dock, E. O. Jordan and W. L. Wood, *J. Prev. Med.*, 3: 153 (Mar.), 1929.

The Effect of Grape Juice on Nitrogen Retention and Urinary Acidity—The literature records both an increase and decrease in urine acidity according to the fruits ingested and there is some evidence that orange juice has a favorable effect on nitrogen retention. The present work deals with a commercial grape juice on a group of normal women.

In the first series, the basal diet of crackers, cheese, apple butter and almonds was supplemented by grape juice. In the second series, the basal diet was supplemented by grape juice in two experiments and by the caloric equivalent of the grape juice in glucose in two other experiments.

After a 5-day adjustment period, in the 3- to 4-day experimental period following daily nitrogen determinations of

urine and feces were made. In the first series the nitrogen retention was greater in the grape juice supplements. In the second series with equivalent energy diets the increase in nitrogen retention was insignificant—0.28 and 0.48 gm. compared to 0.98 and 1.11 gm. on the grape juice plus basal diet in the first series—indicating the nitrogen retention due probably to the sparing action of the carbohydrate in the juice.

In these series the urinary acidity remained almost constant. In one case there was a slight decrease, and in three a slight increase following grape juice addition, showing considerable quantities of grape juice have little or no effect on urinary acidity.—Louis M. Pickens and Rossleene Arnold Hetler, *J. Home Econ.*, 22: 44 (Jan.), 1930.

**Hypervitaminosis and Vitamin Balance.** IV. An Instance of Vitamin Balance—Only two references in the literature are cited as to the lack of balance between vitamin B complex and vitamins A and D or cod liver oil and one of these is the previous work of the present authors. In the former experiment large quantities of cod liver oil were administered and in the present experiment, oil concentrate. Similar basal diets were fed to matched sets of young rats supplemented by 1, 2, 4, 8, 16, and 32 per cent standard marmite extract. To each set cod liver oil concentrate at the rate of 2, 10, 50 and 250 mg. per 10 gm. of basal diet was added.

At the 1 to 2 per cent marmite level, 0.10 per cent concentrate did not stop the decline. At the 3.2 per cent mar-

mite level the addition of 0.10 per cent concentrate caused decline in weight but at the same level without concentrate rats were smooth-coated and did not decline in weight. Two animals on the 2.5 per cent concentrate died; controls receiving only 0.02 per cent concentrate remained well and grew. In the 8 per cent marmite level, optimal for ordinary diet, up to 0.5 per cent concentrate did not cause death but retarded growth. The 16 to 32 per cent marmite level concentrate up to 2.5 per cent was tolerated and two animals died.

The symptoms caused by excess of vitamins A and B parallel those with simple vitamin B<sub>1</sub> deficiency. The probability that the high doses of A and B concentrate are in any way poisonous is offset by the ability of the rats to withstand increased doses with increased marmite allowance. It appears more probable that the effect is not due to toxic action of vitamins A and D but to relatively inadequate vitamin B balance since the symptoms resemble B avitaminosis.

It is pointed out that vitamin D was administered at levels from 6 to 750 times the minimal physiological dose while other works have shown that a thousand times the minimal as irradiated ergosterol does not act unfavorably.

Vitamin A was increased from 200 to 25,000 times the minimum dose, hence the conclusion that the lack of balance is due to the vitamin A of the concentrate although the effect of other unidentified substances cannot be excluded.—Leslie Julius Harris and Thomas Moore, *Biochem. J.*, 23: 1114, 1929.

# PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.\*

**Miss Fox Goes to New Haven—** The American Red Cross has announced the resignation of Miss Elizabeth G. Fox, the National Director of their Public Health Nursing Service, to take effect some time in May. She will become Executive Director of the Visiting Nurse Association of New Haven, Conn., and a member of the faculty of the Yale School of Nursing.

Miss Fox came to the Red Cross nearly twelve years ago as Associate National Director of Public Health Nursing. Since August 8, 1919, she has held the position of National Director of Public Health Nursing. A native of Wisconsin, she attended the University of Wisconsin where she attained high scholastic honors. Following her training at the Johns Hopkins School of Nursing she held key positions on the nursing staffs of the University Hospital, University of Minnesota; Chicago Visiting Nurse Association; Dayton, O., Visiting Nurse Association; and the Visiting Nurse Society, Washington, D. C.

Miss Fox has at one time or another served in high elective or appointive positions in most of the local, national and international nursing associations with which she has been identified. In Washington, D. C., she was president of the Graduate Nurse Association and president of the Board of Nurse Examiners. She has been president, also, of the National Organization for Public Health Nursing; chairman of the Public Health Nursing Section of the American

Public Health Association; and a member of the Nursing Advisory Council of the League of Red Cross Societies.—Letter to Red Cross Nursing Field Representatives by the American Red Cross, Feb., 1930.

**The Public Health Nurse and Social Hygiene—**Late last summer, through a financial arrangement with the American Social Hygiene Association, Edna L. Moore was added to the professional staff of the National Organization for Public Health Nursing, as Assistant Director. She will concentrate her efforts on interesting and educating public health nurses in the problems of social hygiene. In the January, 1930, *Public Health Nurse* she says:

The public health nurse, because of her established position in the community and her intimate contact with the home, has many opportunities to reach out into this field where educators are giving such splendid leadership. To grasp these opportunities and accept the responsibilities they carry, demands, primarily on the part of the nurses, an attitude of understanding and acceptance toward sex problems.

She goes on to say that the venereal disease question is a health question from our point of view, and it should be treated as such without confusing it with the idea of reform, because if men or women suffering from venereal disease sense in us the idea that their condition implies an act utterly reprehensible to us, we cannot hope to gain their confidence or help them to help themselves.

Up to the present time the public health nurse has played a small part in the venereal disease control program, and Miss Moore thinks it is because of inadequate preparation combined with

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lack of leadership and too many other duties. We need specific answers to three questions:

1. How is community health affected by syphilis and gonorrhea?
2. What are the community resources to find and treat those affected?
3. What, precisely, can public health nurses do about it?

Some suggestions are given as to how public health nurses can help: Develop and extend prenatal work, as too many obstacles separate the expectant mother from diagnosis and the pregnant syphilitic woman from adequate treatment.

The public health nurse has many opportunities to discover congenital syphilis and avert some of its tragedies in her preschool, school and industrial nursing work.—Edna L. Moore, *The Place of the Public Health Nurse in Social Hygiene*, *Pub. Health Nurse*, XXII, 1: 32 (Jan.), 1930.

**The Institute for Lay Boards in Chicago**—This institute arranged by the Central Council of Nursing Education for lay boards of hospitals and public health nursing organizations was held at the Palmer House in Chicago, February 17.

The morning program was largely given over to public health nursing problems.

Edna L. Foley, R.N., superintendent of the Chicago Visiting Nurse Association, gave an address on "The Education of the Nurse from the Point of View of Public Health Nursing." She made five suggestions as to how the hospital nursing schools should prepare nurses for the public health field:

1. Prepare young women of *character*.
2. Give them certain fundamental essentials of social work.
3. Arrange for affiliation with a public health nursing association.
4. Arrange for lectures to arouse interest in patients as human beings.
5. Send nurses into this field who are socially adequate.

Miss Foley says the visiting nurse's motto should be—"Practice what you preach and teach at the same time."

Haven Emerson, M.D., of Columbia University, gave an address on "Public Health Nursing—Indispensable and Economical for Everyone if Organized," in which he stressed the need for the unification of all public health nursing services in a community in a generalized program as the only means of insuring an economical and really effective service. Following are some of the facts and suggestions from his talk:

The rating of health of 24 cities in the United States runs closely parallel to the number of public health nurses employed, and the death rate is not a good index of the public health work in a community.

In 24 cities in the United States, forty per cent of the public health nurses are serving 20 per cent of the population.

A city caring for 40 per cent of the defects of school children is going a long way toward tuberculosis prevention.

Thirty per cent to 50 per cent of clinic patients need mental hygiene more than anything else.

These are all arguments for generalized public health nursing services.

The nursing technic of the good visiting nurse associations is as adequate as that in the operating rooms of the best hospitals.

Michael M. Davis, M.D., of Chicago, in discussing Dr. Emerson's paper said that most of the money paid for the care of patients in a visiting nurse association came from life insurance companies. In 25 cities studied only two visiting nurse associations earned as much as 21 per cent of their money from fees from individual patients for service rendered; in 19 cities the fees from this source were less than 10 per cent.

Dr. Davis said that the way to increase the amount of money derived from direct service is to present nursing service through community chest and visiting nursing association campaigns in terms that are *not* charity,

yet, at the same time, insuring free care for those unable to pay.

**A High School State Board of Health**—The following program has been worked out for a senior high school board of health only this year, in the Morton Senior High School at Richmond, Ind. Because of the general educational trend which we hoped it would take it was patterned after the State Board of Health, rather than the City Board of Health. One member from each of the 40 assembly rooms was elected by his group to membership on the board. From this representation were elected a president, vice-president, secretary, and 4 division chairmen. The divisions were named health and hygiene, communicable diseases, vital statistics, and sanitation. Each member of the board was appointed to serve on one of these divisions. The dean of the high school is faculty sponsor, and the school nurse, who is Director of Public Health Nursing in Richmond and

Wayne County, is professional sponsor. Each division has a faculty adviser; i.e., the biology teacher is adviser for the division of communicable diseases; the chemistry and physics teacher for the division of sanitation. The vital statistics division is sponsored by the teacher of printing. The work of the health and hygiene division is sponsored by the French teacher, whose particular interest is in personal hygiene.

The board meets monthly to hear reports from the division chairmen, make plans for future projects, and discuss health problems. Division meetings are held at the call of the chairman not less than once monthly. A report of the meeting is sent to each teacher the following day, this report to be posted where her advisory group can read it.

The results have justified the existence of this organized effort and the board of health bids fair to become a potent factor in the development of a health consciousness in the school.—Virginia Jones, R.N.

# EDUCATION AND PUBLICITY

EVART G. ROUTZAHN\*

**Joyous Living Longer in Syracuse**—The new radio "club" was announced as follows:

A Live-A-Little-Longer Club is being started in Onondaga County. Its object is to enable its members to be as healthy and strong as Jack Dempsey and Helen Wills, as beautiful as Apollo or Billie Dove and as old as Methuselah.

Membership is open to everyone, young and old alike, even including bald-headed men who have lost all their teeth. The preliminary announcement about this new organization states that it does not cost a single red cent to join. Its rules for avoiding sickness and for prolonging life are to be as free as the very air that people breathe.

During the past half century the average age of the American people has been raised from 40 to 57 years. The announcement states that there is every reason to believe that the average length of life can be still further extended.

The Club is sponsored by the Health Educational Division of the Onondaga Health Association. The meetings of the Club will be held at 6 o'clock each Wednesday evening and will last only about five minutes. Those desiring to join are invited to tune in on WSYR, Hotel Syracuse Broadcasting Station, promptly at 6 o'clock each Wednesday.

**Education in Clinics**—At Boston, June 9, at the National Conference of Social Work, will be continued the discussion of health education in clinics which was started at the A. P. H. A. meeting in Minneapolis.

Please help by sending samples, photographs, answers to the following questions:

Do you use exhibits? What are they? Where do you display them?

Do you use posters or placards? Where secure them, or do you make them?

Do you use slides or film-slides?

What do you have for people to read? Do you use scrap books or printed matter mounted in any fashion?

What else do you use, or do? What do you like, or object to?

Examples of devices and material will be shown at this session of the Health Division. Address your contributions to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

**Health Demonstration Before Rotary Club**—A Georgia Health Center asks for ideas to be forwarded via editor of this department:

We have been asked to put on a program for the Rotary Club at a luncheon meeting. Last year we gave demonstrations of the actual work carried on at the Health Center, to which they contribute.

The Health Center Program consists of visiting nursing, clinics (curative and preventive), milk depot, baby stations, and school nursing service. If you could give us any suggestions for this program, we would appreciate it very much indeed.

**More Statistics in State Press Releases**—Another group of the lead paragraphs from Illinois press releases illustrate possibilities in effective use of statistical data. The full release in many cases could be adapted to other states, and with further changes could be adjusted for large city use.

Springfield, February 12: Mistaking symptoms for disease and treating terminal instead of incipient conditions account for a major part of Illinois' \$120,000,000 annual sickness bill. This, according to Dr. Andy Hall, state health director, is proved by an experiment with 6,000 individuals which shows an 18 per cent reduction in mortality as a result of annual medical examinations during apparent good health.

\* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

"The experiment shows that 6,000 policy holders of a certain insurance company were given annual medical examinations over a period of 10 years," said Dr. Hall. "This group, selected at random, enjoyed an 18 per cent better mortality experience than the other policy holders in the company of comparative age. In economic terms the 6,000 individuals got \$3.00 back in the form of extended earning time for each \$1.00 spent for the examinations."

Springfield, February 19: By far the biggest decline in nearly a decade marked the course of mortality from tuberculosis in Illinois last year. This statement was accompanied here today by an announcement from Dr. Andy Hall, state health director, that April will be devoted to an extensive campaign against tuberculosis in children, the great seed-bed of the disease. At last year's rate of decrease, tuberculosis will practically disappear from the state in 25 years.

"Provisional figures show that mortality from tuberculosis reached a new low level in Illinois last year when 5,248 deaths gave a rate of 70 per 100,000 population," said Dr. Hall. "This is 4 per cent below any previous rate ever registered in the state, while the degree of decline was greater than for any year since 1921. The actual number of deaths fell 200 below the 1928 figure while the population is estimated to have increased by 82,000. The decrease last year in tuberculosis took place in Chicago as well as down-state."

Springfield, March 5: An expanding practice of birth control on the one hand and a growing effectiveness of disease prevention on the other are indicated in statistics made public here today by Dr. Andy Hall, state health director, which show sharp declines in the birth and mortality rates for Illinois last year.

The number of births in the state last year fell a full thousand below the 1928 figure, giving a rate of 17.2 per 1,000 population, the lowest rate on record in Illinois. Deaths dropped 2,403 under the number for 1928, giving a rate of 11.7, one of the most favorable on record.

The 128,634 births and the 87,789 deaths registered in the state last year gave an excess of 40,845 births over deaths. This figure gives a net increase in population from this source of about one-half of one per cent and adds about one person per square mile to the density of population.

Excess of births over deaths in Illinois has dropped from 71,228 in 1921 to 40,845 last year, a fall of 42 per cent in the ratio. In the face of an increasing population the actual number of births has declined from 144,637 in 1921 to 128,634 last year, a drop of 11 per cent.

The continued fall in the birth rate, which involves the best elements in the population much more than the worst, would be a cause of distinct alarm were it not for the somewhat compensating influence of preventive medicine. . . .

**Social Work Publicity at Boston in June**—At the National Conference of Social Work, the Health Division will have one education-publicity session; Educational Publicity Division, 5 morning sessions; and Social Work Publicity Council, 10 luncheon, afternoon and dinner sessions, with several simultaneous round table groups. Public health workers make up the largest membership group in the S. W. P. C., so that a goodly number of live health workers will be at Boston. Frank Kierman, Massachusetts Tuberculosis Association, is the Boston local chairman for the publicity group.

**The Beginnings of Health Education-Publicity**—When did popular health education begin? When did one or more forms of publicity become generally accepted as a phase of public health?

These and related questions have been raised recently by several editors and writers. What can you dig out of the past? Please write to editor of this department. Samples of the earliest publicity of any kind—from 10 years ago, or 20 years, or further back—will be received with much appreciation.

**New England Health Institute**—Meeting in Boston, April 14-18, the Public Health Education Section under the chairmanship of Ira V. Hiscock will present the following:

Training for Health Education—C. E. Turner, Richard Schmoyer; Printed Matter Clinic—R. S. Patterson, H. E. Kleinschmidt, P. E. Gillingham, Harford Powell, Jr.; Health Education—Mabel Bragg, Ernest Stephens; School Health Education and Public Health—M. L. McWilliams, Fredrika Moore; Planning an All-Year Round Program on Health Publicity—M. S. Routzahn, F. L. McKay; The

Place of Health Education in Normal Schools—F. W. Wright, J. A. M. Andress; Individualization in Public Health—R. C. Cabot.

Section on Vital Statistics will have: Annual Reports Use and Abuse—I. V. Hiscock, Charles Duncan; Use of Statistical Tracts in Planning Health and Social Propaganda—Iago Galdston, J. J. Balf.

**A Division of Public Health Education**—The recently issued report on 1928 health education by the New York State Department of Health tells of a surprising amount and variety of the educational work. The main topics covered are: radio talks, newspaper use of radio talks, the weekly bulletin, newspaper publicity, correspondence course for nurses, conference of health officers and nurses, exhibits and motion pictures, lectures, correspondence, Department publications, mailing room activities.

In handling requests for information much use is made of the mimeographed press releases of the radio talks. A list of 51 radio talks is given in the report. *Free.*

**Again General Warnings Are Questioned**—Under "Too Much, or Too Little" (Oct., 1929, page 1171) we quoted *Editor and Publisher* in criticism of health warnings against unidentified products. Another point of view is expressed by F. P. A. in the *New York World*:

Our belief is that Dr. Wynne's so-called war on radio broadcasting by so-called fake medical advertising is toothless. What are the concerns that Dr. Wynne thinks broadcast fake medical advertising? What are some of the alleged quack remedies advertised? Are they harmful, or habit-forming, or both?

**Photographs Wanted**—Several book publishers are seeking photographs illustrating health conditions or health education methods. If you have good photographs to offer, please tell the ed-

itor, and write George H. Betts, School of Education, Evanston, Ill., for the list of 46 subjects wanted for a revision of the Emerson and Betts Health and Hygiene Series to whom "any striking health activity or safety measure will be acceptable." You get credit *and cash.*

**Forms of Printed Matter**—For the benefit of writers who are confused in their use of terms to apply to various types of printed matter, it seems desirable to reprint some definitions.

*Handbills*—"The handbill or dodger is a single sheet printed on one side which is handed to people on the street, dropped into house mail boxes, thrown on doorsteps, or posted in public places. . . . The handbill is usually small enough (about 6 by 9 or 8½ by 11 inches) to be carried in the hand and large enough to be posted on a wall or bulletin board."

Further discussion of the place of the handbill in the publicity scheme, and how to make it most effective, will be found in *Publicity for Social Work.*

(Further definitions next month.)

**Propaganda**—"Propaganda," says Edmund B. Chaffee, "has been used as far as we can learn by every great social, political and religious movement which the world has known."

But just what is propaganda? The *Encyclopedia Britannica* defines it as "a concerted scheme for the promotion of a doctrine or practice, more generally the effort to influence opinion." This is the *Encyclopedia* definition but possibly we can get at the real meaning to the average man by saying that the essence of it consists in the spreading of reports and deductions from them for the purpose of influencing public opinion and conduct. These reports, of course, may be true, partly true, or false. They may be by word of mouth or the printed word. They may spring from good motives or from bad. These things make no difference as far as our word is concerned. The word propaganda covers any deliberate effort to disseminate information for the purpose of influencing conduct in the direction desired by the propagandist.

Then follows an interesting discussion of "Ethics and Propaganda," in *Unity*, 700 Oakwood Blvd., Chicago, Ill., Feb. 3, 1930. 15 cents.

#### RADIO

New York State Department talks: Security and Mental Health, Modern Magic (prevention of babies' sore eyes), A Horoscope for 1930-1931 (the "signs" of health).

The U. S. Public Health Service has issued these talks: Some General Dietary Hints, Heart Disease and Its Prevention, Preventing Diseases of the Teeth and Gums. (Much good material after the "big words" have been eliminated.)

The Department of Health of New York City has broadcast on the following: How to Get Fat, Facts About Quacks, Winter Exercise, The Common Cold, Tuberculosis—Early Discovery—Early Recovery (about 2,300 words each).

The series of radio talks on radio quackery, broadcast by the Health Department of New York, will be supplied upon request.

Broadcasting by the Connecticut State Department of Health has been changed to 12:00 noon (Eastern) on Thursdays. Station WTIC.

The Live-A-Little-Longer Club, Onondaga Health Association, Syracuse, holds its weekly meetings via radio at 6:00 p.m., Wednesdays. Station WSYR. The opening session has been mimeographed for distribution.

The House Fly, several mimeographed sheets, provides broadcast material or copy for other uses. Lively and very frank as to fly filth. Address Rutherford County Dept. of Health, Murfreesboro, Tenn.

See also "Dates Ahead."

#### DATES AHEAD

April—Early Diagnosis Campaign. Address National Tuberculosis Association, 370 7th Ave., New York, N. Y.

A variety of materials and suggestions are available. Especially interesting is the "Manual" which is supplied in one booklet, or in three booklets divided for workers with physicians, school groups, and parents and the public.

April 14-18 (Monday-Friday)—New England Health Institute, Boston. With various publicity sessions. Address George H. Bigelow, Dept. of Public Health, Boston, Mass.

April 17 and 24 (Thursdays)—Broadcast by American Junior Red Cross via Columbia System. The program:

With a cast made up of Juniors assisted by a professional character actor the program will demonstrate a Junior council meeting attended by a physician who, at the request of the council, has made a study of health conditions in the community and the school. The Junior council receives the doctor's report, comments on various phases of it, and develops with his help the remedies for the undesirable health conditions which exist in the town.

April 26-May 3—Boys' Week, with Tuesday, April 29, as "Boys' Day in Schools and Health Day." Address National Boys' Week Committee, 211 West Wacker Drive, Chicago, Ill.

May 1 (Thursday)—May Day and Child Health Day. Address American Child Health Association, 370 7th Ave., New York, N. Y. Special material includes: pageant, poster, Festival Book, Play Day—The Spirit of Sport, Teamwork for Child Health, Child's Bill of Rights, recreation poster, a simple musical pageant, cuts or mats of May Day seal, and a series of mimeographed sheets of suggestions.

May 7-10 (Wednesday-Saturday)—National Tuberculosis Association, Memphis, Tenn. With a critique of printed matter by Douglas McMurtrie of Chicago, and a demonstration of the Tuskegee travelling health school.

May 12 (Monday)—National Hospital Day.

May 18-21 (Sunday-Wednesday)—Advertising Federation of America,

Washington, D. C. Address at 420 Lexington Ave., New York, N. Y.

Armstrong. Reprint from *Long Island Medical Journal*. 5 pp.

#### DIPHTHERIA

"Children Who Might Live," by W. W. Bauer. *Hygeia*. Mar., 1930. Popular article.

"The Study of Poster Art Advances," by Z. B. Kimmey. *Poster Magazine*, Chicago, Ill. Jan., 1930. 35 cents. Based on New York's high school poster contest. 4 diphtheria posters illustrated.

"Diphtheria in Ansonia." *Weekly Health Bulletin*, Connecticut State Department of Health. Mar. 3, 1930. Striking 10-year comparison of an anti-diphtheria city with two neglectful ones.

Announcement of the second New York State diphtheria poster contest. S. C. A. A., 105 East 22d St., New York, N. Y. 8 pages. Free. A happy idea is that the committee supplies the text (5 alternative forms) to appear on a poster.

Report blank for a local campaign prepared by the State Charities Aid Association, 105 East 22d St., New York, N. Y. 4 pages, 9 by 12 inches. Includes statistics, campaign organization, details of house to house canvass, organization of clinics (including details of equipment to be checked), publicity, how various groups coöperated, etc. A campaign could be planned with no other instructions. With a few changes could be used in any state or county. Free.

#### EDUCATIONAL MATERIAL

The following have been issued by the Metropolitan Life Insurance Co., New York (free):

The Board of Health—What it can and should do—with your support. 14 pp.

Overweight and Underweight—How to Treat Them. 32 pp. Menus, reducing exercises, weight reducing record.

What Is Rheumatism? 12 pp.

The Education of Insured Groups, by D. B.

#### Other sources:

New York Tuberculosis and Health Association, New York, N. Y.: How to Tell What in Popular Health Instruction, by Iago Galdston. Reprint from *A. J. P. H.* 4 pp. Free.

Superintendent of Documents, Washington, D. C.: Nine charts on nutrition and growth—pictures showing effects of adequate and inadequate diets on laboratory animals, prepared by Bureau of Home Economics. 50 cents.

Superintendent of Documents: Heart Disease a Public Health Problem. Reprint, 5 pp. 5 cents.

#### PRESS RELEASES

Recent press releases of state departments have covered the following topics: Child Health Conferences, Parrot Fever, Getting the Camps in Shape (Md.); Disinfection, Scarlet Fever, Sinus Disease (Ore.); Additional Water Safeguard for Travelers (Conn.); Tuberculosis on the Toboggan, Health of the State—February, Bottled Sunshine for Dark Winter Days, Winter Deaths from Heat, Carbon Monoxide Poisoning, More Measles Coming (Ia.); State Health Department Files 50th Report, Empty Sanatorium Beds Are Costly (N. Y.).

The U. S. Public Health Service has been running an extended series of releases based on the annual report and special reports of the Service.

Detroit has discussed the following: Smallpox is increasing, where Are Detroit's Tuberculosis Cases?

New York City offers a weekly review of The City's Health; also Street Sales of Uncovered Pretzels, Parrot Fever, New Serum for Pneumonia, Sixteen New Health Centers, Charter Change to Hush Noises.

#### MOTION PICTURES

"The Girl Scout Trail," a new Girl Scout picture, is supplied free through Visugraphic Pictures, 247 Park Ave., New York, N. Y.

## BOOKS AND REPORTS

**A Book of Crimes**—By A. S. MacNalty. London: Elkin Mathews and Marrot, Ltd., 1929. 328 pp. Price, \$3.50.

The author has given the histories of twelve crimes, some famous and some little known, of the 17th, 18th, and 19th centuries—historically correct in many respects, though here and there interwoven with some romance. He is a facile writer, using language sometimes quaint, but always interesting.

The psychology of the crimes is interesting. From the medical standpoint, the description of the poisons used and their effects are the chief points.

The book can be recommended to all interested in criminology, and will serve to pass away a number of hours in an interesting manner for the average physician.

M. P. RAVENEL

**Disease and the Man**—By George Draper. New York: Macmillan, 1930. 270 pp. Price, \$4.50.

In this new volume Draper has attempted to round out his earlier studies, published in 1924 under the title "Human Constitution." Most of the chapters consist of revisions of previously published papers representing his conclusions after 5 years additional experience with the Constitution Clinic of Columbia University.

The author, in his preface, states that in considering disease, it becomes essential for a complete understanding of any given case to understand the man himself. To do this successfully involves an investigation, not only of the usual clinical examination, but also of the four principal contributing factors: The mor-

phological, physiological, immunological, and psychological aspects of the man. He emphasizes his belief that these four panels of personality are all coördinates in determining the susceptibility of the individual to any particular disease.

The book, as a whole, is one of unusual interest. Its texture, however, appears somewhat uneven. In some places the author is extremely technical; in others he descends to a frankly "lay" style. The result seems neither quite "scientific," nor quite "popular." Its chief fault technically is its lack of coherence, with considerable unnecessary repetition, apparently the result of merely collecting and reëditing a series of more or less loosely related studies, rather than attempting to rewrite the material into a unified whole.

The chapters on morphology and genetics are the most thorough and valuable. It is with this field that the author is primarily concerned, and the detailed discussion, particularly of his gastric ulcer and gall bladder types, is most revealing of the scope of his methods of investigation. In the chapter on the influence of sex, he has gathered a considerable amount of interesting material of somewhat elementary nature, and demonstrated its applicability to a small, rather carefully selected group of cases, in support of his hypothesis.

In his chapter on the psychological panel he has delved largely into standard works of other investigators and shown the value of such methods as a means of approach to the study of certain cases. His immunological panel is still largely in the speculative period, as there is very little scientific evidence at hand to support more than the most



theoretical consideration of its significance in respect to disease. The importance of correlating these various aspects of the individual in relation to the specific disease problem is well brought out, and the need of much further work in this direction indicated.

The book is one which should reach a fairly wide and discriminating public.

LAWRENCE W. SMITH

**The Road to Health**—By John P. Koehler, M.D. *Milwaukee Health Department*, 1929. 85 pp. Free.

Hats off to the Health Officer of Milwaukee! He has written a booklet on personal hygiene, which is published by the local health department and distributed free, presumably to the residents of the city. Fitting the pocket and only 85 pages in length, it still covers adequately the familiar ground of healthful living.

Captious critics might wish for more color and warmth in make-up and text. Other health officers will read it and convince themselves that they could do better. Let them try! Public health would receive a great impetus if others would attempt the publication of such a booklet and do half as well.

R. S. PATTERSON

**Health Work in Soviet Russia**—By Anna J. Haines. *New York: Vanguard Press*, 1928. Price, \$.50.

This little book is one of the *Vanguard Studies of Soviet Russia*, edited by Jerome Davis of Yale University. It is the result of a study extending over several years during which the author had abundant opportunity for observation.

Some of the outstanding points brought out are that the Russian of today regards physical health as important a factor in life as education; that doctors are limited to a working day of 6 hours; that all workers in medical institutions, including doctors,

nurses, orderlies, laundresses, stove men, chauffeurs, etc., are organized into the *Medical Workers Union*; that there are night sanatoriums for tuberculosis; and that the infant mortality rate dropped from 27 per 100 in 1913, to 17 in 1923.

The author holds that the Soviet Commissariat of Health has made a real contribution to the administration of the world's work, and that its influence on medical work in Russia is very real. She evidently believes that a better acquaintance will spread its influence to other countries. In Russia the emphasis on medical education has been shifted from laboratory research to practical service, though abundant time and opportunities are given for research.

Russia has for a number of years been such a closed country to the average person that one finds it difficult to evaluate the statements of the author, who has evidently become enthusiastic over the work done in that country.

M. P. RAVENEL

**Healthful Living. The Why and the How**—By S. E. Bilik, M.D. *New York: Scribner*, 1929. 261 pp. Price, \$2.50.

Another book on the perennial subject of personal hygiene needs some distinguishing marks if it is to escape engulfment in the profusion of literature on this topic. This one is written in a breezy style which is neither difficult to peruse nor to comprehend. It has color and individuality and the author is outspoken in giving his own opinions, most of which, however, are sound and free from faddism. He admits having been inclined at one time or another toward various fads and even cults, but to his credit he has emerged from all such erroneous ways and the result, as printed here, is a commendable piece of work.

The usual material on personal hygiene is included. There is an excellent

chapter on exercise, a subject in which the author, as a former athletic director, seems particularly proficient. There is also an interesting discussion of the healing cults, which by its frankness and freedom from abuse demonstrates that the regular practitioner is the only safe general healer. The remainder of the book seldom rises above mediocrity in content, the chapter on diet, for example, being about the average in such books, or not quite fair in quality.

The lay reader would probably enjoy reading this book and would get much information.

JAMES A. TOBEY

**Schistosomiasis and Malaria in Relation to Irrigation**—By J. F. C. Haslam, M.C., M.D., M.R.C.P. Ed., D.P.H. London: His Majesty's Stationery Office, May, 1929. 52 pp. Price, \$35.

This report deals with a subject of growing importance from the public health standpoint. As the population of the world increases, so must new lands be brought into cultivation, many of which require irrigation.

Schistosomiasis (endemic hematuria) is one of the most common of all diseases in certain parts of the world. It is said to be responsible for 25 per cent of the deaths in Egypt; while in some districts, 85 per cent of the agricultural population, and 54 per cent of the proprietors and artisans suffer from the infection. Indeed it is believed by some that these figures are too low. The building of dams and increase in the water supplies furnishes the water necessary for the life cycle of the causative worm. If the eggs do not reach water promptly, they die, and even when hatched, depend upon a fresh water snail as host. The increase of dams and reservoirs also furnishes a problem in regard to malaria, since water is needed for the life cycle of the mosquito.

The report is well done, and ends

with three appendixes, the first giving the geographical bibliography of reported cases of schistosomiasis, the second the relation of irrigation to climate and to nutritive value of crops, and the third the rules enforced in the irrigation concessions in the Sudan. While the report relates only to parts of the British Empire, it contains much that will be of value to sanitarians in every country in which these problems are present and increasing.

M. P. RAVENEL

**Second Annual Report of Ohio Conference on Sewage Treatment**—Held at Marion, O., October 31, 1928. Columbus: State Department of Health, 1929. 61 pp.

The second annual report of the Ohio Conference on Sewage Treatment, which was held in October, 1928, gives in the front abstracts of the papers and discussions. The papers include two on the operation of specific sewage treatment plants and one on the important subject of revenue from sewage sludge. On account of the importance of the Ohio sewer rental method of raising funds for sewage treatment and the general interest in this subject in the State of Ohio, some time was given to the discussion of this law. These are included in the report.

ARTHUR P. MILLER

**Practical Handbook for Diabetic Patients**—By Abraham Rudy, M.D. Boston: Barrows & Co., 1929. 361 pp. Price, \$2.00.

This book is an important addition to the large number of handbooks for laymen on diabetes. Dr. Rudy recognizes the important fact that all types of patients suffering from diabetes cannot be treated alike. Each patient has certain family and racial characteristics which must be taken into consideration in treatment for any disease, especially one so chronic as diabetes.

The native American, with minor exceptions, will eat almost any kind of

food. The people of the Jewish and Italian races among whom diabetes is most prevalent have developed many idiosyncrasies, habits, and distastes for foods, which must be taken into consideration. The physician cannot in a few days or weeks of treatment change the food habits of a patient, gained from many generations of ancestors.

Dr. Rudy gives an excellent number of menus for various races, particularly Jews. The system of substitution diets is very ingenious and should be widely used.

The format of the book dispels the layman's fear of technicalities. The type is large and clear and easily comprehensible. The book should be recommended to every diabetic.

REUBEN FINKELSTEIN

#### Report of the Westchester County Sanitary Sewer Commission, 1929

—This Commission, which was appointed by the Board of Supervisors of Westchester County, N. Y., in June, 1926, made an immediate study of sanitary conditions in the county and from that drew two main conclusions: (1) that the interior of the county, except for an area of 3 square miles in the Bronx Valley, was without adequate sewage disposal facilities and also without any real hope of relief other than through this Commission; (2) that almost all of the shore section discharged raw sewage into the Hudson River or Long Island Sound, either directly or through very limited treatment plants.

These conditions would have a decided effect on the growth of the county, because of the menace to health and on account of the established fact that a territory cannot reach its maximum growth without adequate sewage collection and disposal facilities. To correct the conditions found, the Commission is rapidly developing comprehensive plans. Four projects costing almost \$13,000,000 are either completed or close to

completion and the Commission's report to the Board of Supervisors on three other projects which will cost almost \$10,000,000 is awaiting the action of that board. A preliminary and approximate estimate of the final cost to complete a sanitation program in Westchester County is almost \$56,000,000. Such an expensive program as this is feasible only because the assessed valuation in this county is very high.

ARTHUR P. MILLER

*The Hebrew Physician*—*Moses Einhorn, M.D., and L. M. Herbert, Editors (Printed in Hebrew). 983 Park Avenue, New York. Vol. 1—No. 2, 1929–1930.*

The second issue of *The Hebrew Physician* (Harofeh Hoibri), the only Hebrew medical journal published outside of Palestine, has just made its appearance.

This consists of 180 pages, and contains numerous articles on general medical subjects, including a copy of the manuscript on "Hemorrhoids," by Shlomo Eben Ayub of Badrash, France (1265 A.D.). A special section is also devoted to new Hebrew medical terminology.

*Home Nursing and Child Care*—*By C. E. Turner, Dr.P.H., Nell Josephine Morgan, R.N., and Georgie B. Collins—Malden Health Series. Boston: Heath, 1930. 282 pp. Price, \$1.20.*

The authors, in their preface, mention that the material is not new "except in organization and method of presentation." We agree with them. They have included some very fine, practical knowledge, in logical sequence. The book opens with "What nursing means to the home," and continues with "Selection and care of the sick room." The chapter on symptoms is followed by methods of taking temperature.

It has splendid chapters on infec-

tions, antisepsis and control of communicable diseases. Personal hygiene of childhood and youth is treated in a sane, practical manner. Actual, scientific and usable facts are given, though it seems to us these might have been presented in a less businesslike manner. Perhaps the authors are relying upon the instructors to animate the subject matter. They mention, for instance, that it is safer to give an egg to a pre-school child for breakfast than for supper. If we were an adolescent we would like to know why. The book is filled with excellent, graphic illustrations; in fact, they actually "speak for themselves."

There are at present very few books which can be used as texts for students of home nursing and child care, whereas the demand to teach these subjects is growing by leaps and bounds. It seems to us that the majority of the textbooks available are too "grown up." This was written expressly for the upper junior and lower senior high school student and will, no doubt, be welcomed both by students and instructors of home nursing and child care.

HENRIETTA LANDAU

**Handbook of Bacteriology for Nurses (3d ed. rev.)—By Harry W. Carey, M.D. Philadelphia: Davis, 1930. 282 pp., 43 ill. Price, \$2.25.**

As ten years had elapsed since the second edition of this useful handbook appeared, it was found necessary to rewrite the entire work and to enlarge it to meet the more exacting requirements of the National League for Nursing and the State Boards of Education. The needs of nurses traveling beyond our national borders were likewise met by the inclusion of some of the more common foreign diseases.

The book consists of 20 chapters, a series of laboratory exercises and demonstrations, glossary and index. Virtually every phase of bacteriology is

treated with sufficient fullness to make it of value to many others than nurses. Bacteriophage has been omitted. The inclusion of chapters on bacteria in water and milk, pathogenic protozoa and diseases caused by unknown organisms makes this volume worthy of being on the shelves of all health officers and general practitioners. Of pedagogic value are the lists of review questions at the end of the various chapters.

Errors are exceedingly rare, but there is one in the illustration on page 197 where the male mosquito is designated as the female, and *vice versa*. However, this illustration is taken from Zinsser's well known text—where the same error is committed. Zinsser copied from Carroll, but the latter reference is not at hand to this reviewer.

C. F. ADAMS

**Feeding the Family—By Mary Swartz Rose, Ph.D. New York: Macmillan, 1929. 476 pp. Price, \$5.00.**

The third edition of Dr. Rose's eminently practical and authoritative text should prove, as the previous editions have, an ever-present help to any family. All of the valuable material of the first two editions is carried over into this very complete new volume. In addition, the results of the most recent research concerning the various vitamins brings the work up to date in that connection and in Dr. Rose's very direct, simple, live style which means much to the understanding of the lay mind. New diet lists have been made and the tables of calories and dietary recipes which appeared to be so complete in the earlier editions have been revised and made still more comprehensive in this one. Every age, type, and occupation is taken into consideration in these plans, as well as the cost of the food necessary to carry them out.

Out of the 15 chapters which the book contains, 6 are given over to the

food necessary to maintain the growth of the child from babyhood to youth. A chapter each is given to the adult man, the adult woman, and the man or woman "after 50." These form the body of the book. They are preceded by two introductory chapters on the significance of food in relation to the maintenance of the entire body and the care of the "Digestive Mechanism," and followed by 3 chapters given over to family menus, and cost of preparing those menus.

The concluding chapter is devoted to food for the sick and convalescent and answers many a puzzling question for the anxious member of the family who has to meet this problem. After this come 100 full pages of an appendix containing the calorie portions of everyday foods, dietary recipes that are both palatable and healthy, a table of calories to be found in different foods, the practical fitting of foods to the family pocketbook, and, at last, the height-weight tables for different ages so that the families may prove for themselves the value of eating properly for health.

The whole book is written in a most attractive style and made still more attractive by a number of full page illustrations, several of which are in color.

LENNA L. MEANES

**The Medical Museum.** *Modern Developments, Organization and Technical Methods Based on a New System of Visual Teaching*—By S. H. Daukes, O.B.E., M.D., D.P.H., D.T.M.&H., Director of The Wellcome Museum of Medical Science affiliated to The Bureau of Scientific Research. London: The Wellcome Foundation, Ltd., 1929. 183 pp.

Dr. Daukes has presented in a beautifully illustrated book methods of museum display and classification, with a reference list which includes the more important articles on museum technic. While the method of display shown in

the some 30 half-tone plates is not new, it is perhaps better worked out in its details than any other previous presentation. The book should be of value to all those concerned in museum work and the methods can also be adapted to other types of educational display, particularly along the lines of preventive medicine and public health.

MAJOR GEORGE R. CALLENDER

**Pathogénie et traitement de l'asthme bronchique.** *Mémoires couronnées publiés par l'Académie Royale de la Médecine de Belgique.* Vol. 24—By M. A. Haibe. 42 pp. 1929.

This investigation was awarded the Simont prize of the Royal Belgian Academy of Medicine. It deals with "bronchitic asthmas" though recognizing the larger group of responses designated as "asthma." Hemolytic streptococcus occurs in the expectorations of 80 per cent of bronchitic asthmatics. Intradermal injection is a valuable indicator for the determination of the antigenic rôle of the isolated germs. Injections of vaccine, repeated at the same point, create a local refractory condition which tends to become general when one injects each time at a new point in the skin. At first the injections of vaccine provoke a considerable afflux of polynuclears in the diseased parts of the lung. They stimulate a leucocytosis of the blood and they alter the blood count, often disturbed in asthmatics, in the direction of a neutrophile polynucleosis.

The autovaccine therapy dries up the source of the antigenic streptococcus and suppresses or attenuates the symptoms of bronchitis and asthma.

The hemolytic streptococcus plays an antigenic rôle of first rank in bronchial asthma. Autovaccines prepared with this antigen give favorable results with many asthmatics, and these results are incomparably superior when treatment proceeds without loss of time.

C. A. KOROID

# A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

**Age and Sex in Tuberculosis—**Endogenous reinfection plays an important part in producing pulmonary tuberculosis in early adult years; waning immunity, environmental and industrial hazards are responsible for the disease in later adult life. These are some of the implications of this interesting article.

CUMMINS, S. L. Factors of Age, Sex and Occupation in Adult Pulmonary Tuberculosis, *J. State Med.*, 38, 2: 99 (Feb.), 1930.

**Early Diagnosis of Cancer—**Schemes for stimulating periodic physical inspections in order to detect cancer while still in the operable stage are discussed. The British viewpoint has several novel features not included in the typical American discussion of this problem.

DONALDSON, M. Early Diagnosis and Treatment of Cancer, *J. State Med.*, 38, 2: 88 (Feb.), 1930.

**Physical Fitness Examinations—**The relative importance of physical and social examinations are set forth in this discussion. "Health Examination" is a misnomer; the author prefers "Physical Fitness" for the good reasons given.

EMERSON, W. R. P. What is a Physical Fitness Examination?, *New Eng. J. Med.*, 202, 7: 330 (Feb. 13), 1930.

**Postvaccinal Encephalitis—**A detailed and accurate presentation of what is known of the cases of encephalitis following vaccination in England and Holland. This intensely interesting paper deserves careful reading by every sanitarian.

FLEXNER, S. Postvaccinal Encephalitis and Allied Conditions, *J. A. M. A.*, 94, 5: 305 (Feb. 1), 1930.

**Dust and Tuberculosis—**In the guinea pig it is possible to light up a quiescent tuberculous infection and render the focus progressive by dusting with siliceous dusts. Human cases need much more study than has thus far been given.

GARDNER, L. U. Will the Inhalation of Siliceous Dusts Activate a Partially Healed Focus of Tuberculous Infection?, *Pub. Health Rep.*, 45, 6: 282 (Feb. 7), 1930.

**Undulant Fever—**A valuable series of papers concerning such important questions as differentiation between *Brucella abortus* and *Brucella melitensis* infections, laboratory diagnosis, bacteriology.

GIORDANO, A. S., and SENSENICH, R. L. *Brucella Abortus* Infection in Man.

CARPENTER, C. M., and BOAK, R. A. The Laboratory Diagnosis of Undulant Fever.

LYNCH, F. B., and CALLAN, A. M. Some Observations on the Agglutination of *Br. Abortus*, *J. Lab. and Clin. Med.*, 15, 5: 421 (Feb.), 1930.

**Correcting Case Rates—**By determining the proportion of deaths from communicable diseases not previously reported as cases, one can correct the morbidity rate to that extent and thus make a more satisfactory fatality rate.

GREEN, H. W. Corrected Fatality Rates in Public Health Practice, *Pub. Health Rep.*, 45, 4: 169 (Jan. 24), 1930.

**Streptococci in Milk—**Specific directions are given for identifying *Streptococcus epidemicus* and the streptococcus of scarlet fever in milk. How these tests are used to safeguard certified milk is described.

HARDENBERGH, J. G. The Identification and Significance of Hemolytic Streptococci in Milk, *New Eng. J. Med.*, 202, 8: 373 (Feb. 20), 1930.

**Poliomyelitis in Canada**—Two good accounts of recent outbreaks of poliomyelitis (in Ottawa and Ontario) describe the methods of collecting and administering convalescent serum, and the results thereof.

LOMER, T. A., *et al.* Report of an Epidemic of Poliomyelitis in Ottawa, 1929 (and)

HARDMAN, R. P., *et al.* Poliomyelitis in Ontario, 1929. *Canad. Pub. Health J.*, 21, 2: 53 and 76 (Feb.), 1930.

**Scarlet Fever Immune Serum**—Contacts given scarlet fever immune human serum were protected to a sufficient extent to cause the author to recommend this prophylactic treatment of young and infirm contacts.

MEADER, F. M. Scarlet Fever Prophylaxis, *J. A. M. A.*, 94, 9: 622 (Mar. 1), 1930.

**Measles Prophylaxis**—Tunnickliff's antimeasles diplococcus serum protected three-quarters of the persons who received it within 5 days after exposure.

PETERMAN, M. G. Antimeasles Diplococcus Serum (Tunnickliff), *Am. J. Dis. Child.*, 39, 2: 294 (Feb.), 1930.

**Rheumatic Fever**—A good general review of the newer knowledge of rheumatic fever covering definition, course, incidence and care, written for nurses. This subject seems to have been considered now from every angle and for every group who might possibly be interested.

ROTH, I. R. On Rheumatic Fever, *Am. J. Nurs.*, 30, 2: 131 (Feb.), 1930.

**Rabies Transmitted Through Milk**?—Should persons drinking milk from a rabid cow be given the Pasteur treatment? The observations recorded lead to the opinion that the preventive treatment is not justified.

MUGRAVE, E. R. Milk-Borne Rabies, *J. Lab. & Clin. Med.*, 15, 5: 460 (Feb.), 1930.

**More About Rheumatic Fever**—Patients with mitral disease of the heart who have had rheumatic fever in childhood have a chest deformity which displaces the left nipple upward and outward from its normal position.

SCHWARTZ, S. P. Displacement of the Left Nipple in Mitral Stenosis, *Am. Heart J.*, 5, 3: 344 (Feb.), 1930.

**Cancer**—This paper bears every evidence of being a sound, inclusive, unbiased summary of the present status of our knowledge in regard to the etiology, the treatment, the prevention of cancer.

STALLYBRASS, C. O. Cancer—A Review of Recent Progress, *Pub. Health*, 43, 5: 135 (Feb.), 1930.

**Rural Tuberculosis Incidence**—Among a group of hospitalized children in Iowa only 16.5 per cent reacted to the intracutaneous tuberculin test. This is an indication how much less general is infection in rural than in urban districts.

TAYLOR, M. H. A Tuberculin Reaction Survey among Hospitalized Children in Iowa, *Am. J. Dis. Child.*, 39, 2: 316 (Feb.), 1930.

# HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Newton, Mass.—The financial statement of the 1928 report of the Board of Health of Newton shows an appropriation of \$49,684, or approximately \$.87 per capita. Of this, \$8,777, or 20.1 per cent of the total expenditure, were for child hygiene; \$10,079 (23.1 per cent) for nursing, and \$9,584 (22.0 per cent) for administration. The excellent diphtheria and scarlet fever records of the past few years are being continued, no deaths from the former having occurred since 1925, or from the latter since 1926. The physical examination of school children has been entirely taken over by the health department. As a result of this work, the percentage of defectives among school children has been reduced from 40 to 12 since 1924. The birth rate has increased from 15.36 to 17.54, and the death rate from 9.75 to 10.6 per 1,000 population.

New York State—Volume II of the 49th annual report of the New York State Department of Health contains the report of the Division of Vital Statistics for the year 1928. The death rate (13.1 per 1,000 population) has been higher only once since 1920. The birth rate of 19.2 was the lowest since complete registration; and the marriage rate, 18.6, the lowest since 1918. However, the infant mortality rate of 65 deaths under 1 year per 1,000 living births was, with the exception of the previous year, the lowest ever recorded. There were 1,295 deaths from puerperal causes, giving a maternal mortality rate of 5.56 per 1,000 births.

The important causes of death are excellently summarized by charts showing the death rates by cause, age and sex for New York City and the rest of the state. Heart disease ranks first as the chief cause of death, 22.2 and 23.5

per cent of all deaths in New York City and the rest of the state, respectively, belonging to this group. Pneumonia ranks second in New York City, with a proportionate mortality of 12.8 per cent, while second place for the rest of the state is accorded to cancer (9.5 per cent of all deaths). Mortalities from typhoid fever (1.8 per 100,000) and from diphtheria (7.4) were the lowest ever recorded with one exception. The death rate from tuberculosis was 82.7, a slight increase over 1927 due to an increase in the rate for New York City, a decrease being shown for the rest of the state. The death rates from diseases of the heart (297.9), cancer (126.7) and diabetes (26.4) were the highest ever recorded. The rate of deaths from automobile accidents (23.0) was higher than in 1927, the increase being due to greater mortality in the rest of the state, the New York City rate having decreased.

An amendment to the Vital Statistics Law enacted in 1929 provides for the payment of actual and necessary expenses to local registrars by their municipalities. The 1929 amendments to the Domestic Relations Law, as affecting the registration of marriages, require the approval of the judge of a children's court to be endorsed upon the marriage license application of girls under 16 years of age, and also require the return of the marriage license and certificate within 5 days after the marriage to the town or city clerk who issued it.

Montreal—The personnel of Montreal's Department of Health has undergone a considerable reorganization and enlargement during the year 1928. The annual report for that year shows an increase in the staff of the Division of Child Hygiene from 11 full-time and 5



part-time inspecting physicians, 1 dentist, and 29 nurses, to 17 full-time physicians, 4 dentists, and 52 nurses. In the Division of Food Inspection, 6 veterinarian inspectors and 6 inspectors of pasteurization have been added, bringing the totals to 9 veterinarian and 7 pasteurization inspectors. The laboratory staff has increased from 3 to 9 members, including the addition of 3 milk bacteriologists.

The efficiency of school medical inspection has been improved by the re-districting of the city into 4 large nursing districts, each of which has been subdivided into 10 subdistricts with a nurse for each. The work of inspecting physicians has likewise been aided by the formation of 16 districts each comprising a baby clinic and supervised by an inspecting physician. During 1928, 68,148 pupils, or 53.24 per cent of those registered in the schools, were examined. Four hundred and fifty per 1,000 of the pupils examined showed one or more defects, excluding dental decay; 523.7 per 1,000 showed one or more dental defects.

A new system of statistical compilation is being organized in order to bring the municipal vital statistics to agreement with that of the Provincial Bureau of Health. For this reason the 1928 general death rate of 14.9 and the infant mortality rate of 143.8 per 1,000 births are not comparable with those of the past.

**Arizona**—The state of health of Arizona regarding communicable diseases is reported as satisfactory in the 8th biennial report of the State Board of Health for the years 1927–1928. A state milk control program was initiated in 1927 with the aid of the U. S. Public Health Service by the drafting of a Standard Milk Ordinance which was adopted by 17 towns.

Although crippled during 1927 because of the lack of funds, the Sheppard-

Towner program of the Child Hygiene Division gave 46 lectures and talks to 1,252 persons, and 47 health conferences were held with a total of 606 mothers. In 1928, 84 lectures with an attendance of 1,226, and a total of 98 health conferences with 837 mothers attending were given.

J. H. W.

**Newark, N. J.**—Newark has prepared an attractively bound 352 page report of the Department of Health for 1928. The volume is replete with cuts and graphs depicting the more outstanding phases of the department's work.

Newark's estimated population is 474,000. Its crude death rate is 11.6 per 1,000, which is reduced to a resident rate of 10.9. This is a slight increase over 1927, mainly due to the unusual prevalence of measles and pneumonia, to which was also attributed an increase of 0.5 in the infant mortality rate (63.8). The deaths from measles rose from 3 to 47, while an excess of 153 deaths from pneumonia was shown in 1928 over 1927. The specific death rate for diphtheria has also increased to a record high for the past 15 years; but in no instance was the victim an immunized child. The death rate for tuberculosis has risen slightly. A slight decrease (34) in the number of deaths from heart disease and apoplexy has occurred over 1927.

The physical examination of food handlers was started in 1920. In that year 2,314 examinations were made, which has increased to 16,779 in 1928. The effect of this work is clearly shown in the reduction in the positive tuberculosis found. In 1920, 9 positive cases were found per 1,000 examinations; in 1928 this figure was 0.3. A positive diagnosis was in each case made with the aid of sputum and X-ray findings. Venereal disease incidence among this group was exceptionally low, a percentage of 0.2 for the entire group being found. Only 1 typhoid carrier was

found; no case of diphtheria was ever detected.

The cost of this work was \$9,000 annually; in 1928 the cost per examination was \$.53.

Two Baby-Keep-Well stations were opened in 1928 to bring the total to 16 stations with 26 conferences a week. There were 51,189 visits made by nurses to 4,236 new-born infants, while 16,950 visits were made to the Baby-Keep-Well stations, a score of 5.2 and 1.7 visits per 1,000 births respectively. Midwife attendance has been consistently lowered, 20 per cent of the births being attended by midwives as against 46 per cent in 1918.

Bridgeport, Conn.—The annual health department report of 1928 occupies a portion of the municipal register of 523 pages. On the basis of an estimated population of 182,936, there is recorded a death rate of 9.4. The outstanding educational effort of the year was a cancer control campaign conducted in cooperation with the local medical society.

A symposium for physicians was addressed by 3 leading physicians in the cancer field. A meeting of nurses was addressed by two physicians, while a meeting for teachers was addressed by a foremost authority on cancer. The United Illuminating Company enclosed a leaflet, giving the early symptoms of cancer, in each of their October bills, totaling 50,000. Eight radio talks were given by the health officer, all having been endorsed by the local medical society. Some 5,200 persons attended public lectures, 530 inches of newspaper space were used, and over 66,000 pieces of literature were distributed. As a direct result of the campaign, 302 patients visited their physicians for diagnosis. Of this number, 81 were found to have early signs of cancer, 25 showed a malignant condition still operable, and 26 had cancer in an advanced stage, while

the remainder showed no malignancy. The local medical society, as a result, has requested the Department of Health to establish diagnostic cancer clinics.

New Jersey—The child hygiene nurse appears to be increasing in favor among the communities of New Jersey, for, according to the 52d annual report of the New Jersey State Department of Health for 1929, 18 nurses were paid from local budgets in 1918 as compared with over 100 in 1928, and 55 paid by the state in 1918 as compared with 20 in 1928. The child hygiene nurse assists the community in maintaining the health of the child from the prenatal period to adolescence, including the school period. School nurses have been converted into child hygiene nurses, thus bringing the prenatal and preschool periods within the scope of the nurse's activities, a vital and important part of the correct approach to the child health problem. These nurses have supervised during the past year 5,034 expectant mothers, 18,764 babies, 21,090 preschool children, and 109,988 school children.

The state-wide diphtheria campaign, in which the department has taken an active part for several years, was continued and reports show that in 1928 over 125,000 children in New Jersey were given toxin-antitoxin at public clinics, a number almost equal to the total number of similar treatments in the preceding 7 years.

There were 324 persons desiring to be licensed as health officers, inspectors or as operators of sewage disposal or water treatment plants examined during the year. Only 98, or 30 per cent, of these were able to obtain a mark of 70 or more. The conclusion seems justified that without such tests many unqualified persons might obtain positions demanding specialized training of a high order.

The program of venereal disease con-

trol rests upon two principal activities—a case finding program, and public instruction as to the facts regarding venereal disease. There were 28,000 individuals who attended the 285 talks given throughout the state. Demonstration clinics presenting the newer drugs and methods to physicians were held in four counties during the year.

The legal control of physical connections between public potable water supplies and other unapproved supplies was secured during the year. New cross-connections are prohibited and those in use must be equipped with all bronze double check valves of an approved type, which are allowed only on yearly

permit. Laboratory tests from 76 water supplies of roadside refreshment stands indicated 33, or nearly half, to be contaminated. The increasing importance of such violations of the Sanitary Code is self-evident.

New Jersey was relatively free from serious epidemics of disease during the year ending June 30, 1929. The death rate for the year 1928 was 12.04 per 1,000 population, within half a point of the lowest rate ever attained in the state. The 1928 birth rate (18.95 per 1,000) is the lowest since 1905. The infant mortality rate for 1928 is 65.6 per 1,000 babies born alive, comparing with 61.3 for 1927 and 70.3 for 1926.

## BOOKS RECEIVED

### RECENT ADVANCES IN PREVENTIVE MEDICINE.

By J. F. C. Haslam, with a chapter on the Vitamins by S. J. Cowell. Philadelphia: Blakiston, 1930. 324 pp. Price, \$3.50.

FACTORS IN THE SEX LIFE OF TWENTY-TWO HUNDRED WOMEN. By Katharine Bement Davis. New York: Harpers, 1929. 430 pp. Price, \$3.50.

HEALTH VIA FOOD. By William Howard Hay. Buffalo: Sun-Diet Press, 1929. 299 pp. Price, \$3.50.

TUBERCULOSIS IN PUBLIC SCHOOL CHILDREN. By Eugene L. Opie, H. R. M. Landis, F. Maurice McPhedran and H. W. Hetherington. Philadelphia: Henry Phipps Institute, University of Pennsylvania, 1929. 636 pp.

NEW USES FOR CAPITAL. By Robert S. Field. Philadelphia: The John C. Winston Co., 1930. 136 pp. Price, \$1.25.

SHATTERING HEALTH SUPERSTITIONS. By Morris Fishbein. New York: Liveright, 1930. 245 pp. Price, \$2.00.

PHILADELPHIA HOSPITAL AND HEALTH SURVEY, 1929. Conducted under the Auspices of a Citizens' Survey Committee. Philadelphia: Philadelphia Hospital and Health Survey Committee, 1930. 844 pp. Price, \$3.00.

OUR NEW RELIGION. By H. A. L. Fisher. New York: Cape and Smith, 1930. 201 pp. Price, \$2.50.

THE MEDICAL TRUST UNMASKED. By John L. Spivak. New York: Louis S. Siegfried, 1929. 170 pp. Price, \$1.00.

INSOMNIA. HOW TO COMBAT IT. By Joseph Collins. New York: Appleton, 1930. 130 pp. Price, \$1.50.

THE ARITHMETIC OF SEWAGE TREATMENT WORKS. By Karl Imhoff. Translated by Gordon M. Fair. New York: Wiley, 1929. 99 pp. Price, \$2.00.

HOW GREAT CITIES ARE FED. By W. P. Wedden. New York: Heath, 1929. 302 pp. Price, \$2.80.

THE BABY'S FIRST TWO YEARS. By Richard M. Smith. New rev. ed. New York: Houghton Mifflin, 1930. 159 pp. Price, \$1.75.

CONTROL OF ENDEMIC DISEASES IN THE NETHERLANDS INDIES. Edited by The Netherlands Indies Medical and Sanitary Service. Landsdrukkerij-Weltevreden, 1929. 77 pp.

SOCIAL CONTROL OF THE MENTALLY DEFICIENT. By Stanley P. Davies. New York: Crowell, 1930. 389 pp. Price, \$3.00.

EDUCATION AND THE SUMMER CAMP. AN EXPERIMENT. By Lloyd Burgess Sharp. New York, Teachers College, 1930. 114 pp. Price, \$1.50.

HISTORY OF NURSING AND SOCIOLOGY. Compiled by a Sister of Charity of Emmitsburg, Md. Bridgeport: Brewer-Colgan Co., 1929. 279 pp. Price, \$3.00.

THE HARVEY LECTURES. Delivered under the Auspices of The Harvey Society of New York, 1928-1929. Series XXIV. Baltimore: Williams & Wilkins, 1930. 216 pp. Price, \$4.00.

ALL ABOUT THE BABY. The Beginnings of Human Life with Early Needs. By Belle Wood-Comstock. Mountain View, Calif.: Pacific Press Pub. Association, 1930. 364 pp. Price, \$2.00.

# NEWS FROM THE FIELD

## MICHIGAN PUBLIC HEALTH ASSOCIATION

THE Ninth Annual Conference of the Michigan Public Health Association in coöperation with the Michigan Department of Health was held on January 8, 9, and 10 in Lansing, Mich. The following officers were elected: President, Don M. Griswold, M.D.; Vice President, Carrie Webster; Secretary-Treasurer, W. J. V. Deacon, M.D.; and Representative on Governing Council of the A. P. H. A., Guy L. Kiefer, M.D.

## YALE SCHOOL OF MEDICINE

THE General Education Board of New York has made a gift of \$400,000 to the Yale School of Medicine. The announcement of the gift was made by Dean Milton C. Winternitz of the School of Medicine. This supplements a \$2,000,000 gift from the same board and Rockefeller Foundation a year ago. The money is to be used for further development on the site of the Sterling Hall of Medicine, and also for other buildings.

## TEXAS WATER WORKS SHORT SCHOOL

THE Twelfth Texas Water Works Short School was held January 27-30, with a total of 272 registrants. The attendance at the laboratory sessions for the first two days broke all previous records with almost 100 present.

John R. Baylis of Chicago presented discussions on two subjects: "The Developments in the Treatment of Highly Polluted Water in the Removal of Bad Tastes and Odors," and "Conclusions at the Chicago Filtration Plant."

Waco, Tex., was selected as the next annual meeting place. The following officers were elected: President, L. A.

Grimes; First Vice-President, W. H. Deaton; Second Vice-President, Bud A. Randolph; Third Vice-President, J. R. John; Fourth Vice-President, George Mincy; Secretary, V. M. Ehlers; Treasurer, E. G. Eggert, and Editor, Ella G. White.

Among the resolutions passed is the following:

WHEREAS, the American Public Health Association is to hold its Annual Meeting in Fort Worth, Tex., the latter part of next October, and

WHEREAS, this organization includes in its membership a section for laboratory workers and a section for public health engineers; therefore, be it

RESOLVED, first, that we give the various Fort Worth local committees our support in making a success of this meeting; second, that the secretary be instructed to prepare a chart or exhibit which will be representative of our organization and will indicate the activities and objectives of our organization.

## DR. PARRAN, NEW YORK COMMISSIONER OF HEALTH

THOMAS J. Parran, Jr., M.D., has been named Commissioner of Health of New York State by Governor Roosevelt. Dr. Parran took office on March 1. He has been Assistant Surgeon General of the U. S. Public Health Service and is widely known in the public health field.

## METROPOLITAN AREA FOOD AND HEALTH OFFICIALS FORM NEW ASSOCIATION

JUDGE B. A. Pyrke, New York State Commissioner of Agriculture and Markets, was elected president of a new association of federal, state, county and city food and health officials of the metropolitan area formed March 5 in New York City.

Forty food and health officials attended the meeting representing the federal government, the states New York, New Jersey and Connecticut, and the following cities: New York, Albany, Port Chester, Yonkers, Riverhead, Newark, Montclair, Trenton, Hackensack, Orange, East Orange, Jersey City, Asbury Park, Plainfield, Elizabeth, Paterson, New Haven, and Greenwich.

The purpose of the organization is to bring together officials concerned with food and public health work so they may discuss common problems, exchange notes, and coördinate and correlate activities to enforce more effectively their various laws and ordinances.

The first meeting of the organization was opened under the temporary chairmanship of W. S. Frisbie, in charge of coöperation, Food, Drug and Insecticide Administration, U. S. Department of Agriculture, Washington, D. C. Problems relating to canned foods, poultry and milk were considered and discussed. Other officers elected were W. R. M. Wharton, Chief of Eastern District, Food, Drug and Insecticide Administration, as vice-president, and Joseph Calloway, Chief of New York Station, F. D. I. Administration, as secretary.

The next meeting will be held on the first Wednesday in June. The group expressed a desire to have arranged for them at that time a display of various types of illegal poultry which have in the past been found on the market.

#### SOUTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION

THE annual meeting of the Southern California Public Health Association was held on February 14 in San Francisco. The following officers were elected: President, Dr. George Parrish; President-elect, Dr. Sven Lokrantz; 1st Vice President, Dr. W. B. Wells; 2d Vice President, Dr. A. M. Lesem; Secretary-Treasurer, Dr. Giles S. Porter; and Head of Executive Committee, Dr. J. L. Pomeroy.

A resolution was passed recommending that papers presented at sectional meetings be made available through the A. P. H. A. to members of all affiliated health associations, supporting the resolutions of the West Virginia Public Health Association (*A. J. P. H.*, 20, 2: 238 (Feb.), 1930).

#### NORTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION

THE Annual Meeting of the Northern California Public Health Association was held on the campus of Leland Stanford University, Palo Alto, on January 11.

The officers elected for the coming year are: President, Dr. Adelaide Brown; Vice Presidents, Dr. Guy Millberry, Dr. Thomas A. Storey, and Dr. Karl F. Meyer; Secretary, Dr. Walter H. Brown; and Treasurer, Mary E. Davis, R.N.

The Association officially approved the request of the West Virginia Public Health Association that the A. P. H. A. work out a method whereby the papers in the local Associations might be published and made available for the various workers in the public health field.

#### UTICA'S MOST USEFUL CITIZEN FOR 1929

CONCLUDING that without health the community and its citizens cannot prosper, the Board of Awards of the Utica (N. Y.) *Observer-Dispatch* decided that any outstanding contribution to the health of Utica deserves first consideration and highest recognition. Therefore Walter G. Hollingsworth, M.D., Fellow, A. P. H. A., was selected as Utica's most useful citizen for 1929 because of his work in the Division of Food and Hygiene.

#### MILK AND CREAM CONTESTS

THE U. S. Bureau of Dairy Industry has prepared a department circular, *How to Conduct Milk and Cream Contests* (Circular 384-C), of which a revised edition is now available for dis-

tribution. This circular offers simple and definite suggestions for conducting such contests and explains the approved methods of scoring. It includes a model score card and several tables which show how to make deductions from a perfect score. The recommended score card allows a maximum of 45 points out of 100 for low bacterial count, 25 points for flavor and odor, 10 points for sediment, 15 points for temperature or acidity, and 5 points for the condition of the bottle and cap. Apply to Office of Information, U. S. Department of Agriculture, Washington, D. C.

#### MEXICANS AND PUBLIC HEALTH

SEÑOR Alfonso Isunza, of Vera Cruz, has been visiting Texas making an intensive study and inspection tour of the various sanitary projects and improvements, including water supplies, sewage disposal, milk sanitation, chlorination, and mosquito control, under the direction of the Texas State Health Officer and the Sanitary Engineering Staff. This study is along the same lines as one made last summer by Señor Anastasio Guzman of the engineering staff of the University of Mexico. These gentlemen with some ten or more other prominent engineers in the Republic of Mexico have indicated their

intention of attending the 59th Annual Meeting of the American Public Health Association.

#### NEW JERSEY NURSES TO MEET

THE annual state conference of the New Jersey Nurses will be held in Elizabeth, N. J., from April 10 to 12. Some of the organizations meeting will be the League of Nursing Education, New Jersey State Nurses Association, New Jersey State Association for Public Health Nursing and the Northern New Jersey Federation of Visiting Nurse Associations.

#### MENTAL HYGIENE SPEAKERS

THE International Congress for Mental Hygiene, May 5-10, 1930, is to be attended by many foreign delegates. Some of these will be available for lecture engagements. Their interests cover a very wide range, and it is probable that a suitable speaker could be found for most any group interested in human behavior. The National Committee for Mental Hygiene will provide information about these visitors, their subjects, their possible itinerary, and availability to any organization interest. Apply to Dr. George S. Stevenson, 370 Seventh Avenue, New York, N. Y.

## PERSONALS

DR. JAMES J. DURRETT, Chief of Drug Control, U. S. Department of Agriculture, was elected February 12, 1930, by the State Committee of Public Health of Alabama to be State Health Officer to succeed Dr. Stuart Graves, Dean of the School of Medicine of the University of Alabama, who was loaned by the University to be State Health Officer pro tempore.

DR. ARTHUR W. K. AKERLEY, for many years a member of the A. P. H. A., died at his home on Flathead Lake, Somers, Mont., on January 30, 1930, at the age of 62 years.

ALICE DUFF, formerly with the Preston County Health Unit, is now a member of the new Monongahela County Health Unit, Morgantown, W. Va.

NELSON E. CLEMENS, D.V.M., has been appointed Health Officer of Hayward,

Calif., to succeed Dr. Fred William Browning, who died recently.

STEPHEN MALONEY, Secretary of the Massachusetts Association of Boards of Health, died suddenly in January of this year.

DR. WILLIAM H. CULLEN, Health Officer of Brasher Falls, N. Y., died on January 28 of pneumonia.

JAMES LOUCHEIM, registrar of vital statistics for Lawrence, N. Y., since 1918, has been reappointed for a period of 4 years. He is believed to be

the oldest registrar in the state—he is now 84 years old.

DR. C. FLOYD HAVILAND, superintendent of the Manhattan State Hospital and former State Hospital Commissioner, died in Cairo, Egypt, in January.

FRANCIS E. FRONCZAK, M.D., Health Commissioner of Buffalo, N. Y., was unanimously elected a Fellow of the Royal Institute of Public Health by the Institute at a meeting held in London, England, recently.

## CONFERENCES

Apr. 3-5, Progressive Education Association, Washington, D. C.

Apr. 7-10, Florida State Conference of Social Work, Jacksonville, Fla.

Apr. 8-11, Short Course on Water Purification and Sewage Treatment, University of Florida, Gainesville, Fla.

Apr. 9-11, Iowa Water Works Operators School, Iowa City, Ia.

Apr. 10-12, New Jersey State Nurses Convention, Elizabeth, N. J.

Apr. 22-23, Arizona Public Health Association, Phoenix, Ariz.

May 5, Texas Health Officers' Conference, Mineral Wells, Tex.

May 5-10, First International Congress on Mental Hygiene, Washington, D.C.

May 6-8, Annual Meeting, State Medical Association of Texas, Mineral Wells, Tex.

June 2, week of, American Water Works Association, St. Louis, Mo.

June 6-14, National Conference of Social Work, Boston, Mass.

June 12-14, Western Branch of American Public Health Association, Salt Lake City, Utah

June 18-19, State and Provincial Health Authorities of North America, Washington, D. C.

June 20-21, Conference of the Surgeon General, Washington, D. C.

## FOREIGN

May 19-21, Second International Malaria Congress, Algiers, Algeria

June 4-9, Congress of Royal Institute of Public Health, Portsmouth, England

June 21-28, Royal Sanitary Institute, 41st Congress and Health Exhibition, Margate, England

Aug. 3-9, Second International Congress for Sex Research, London, England

Aug. 4-9, International Veterinary Congress, London, England

**59th ANNUAL MEETING and  
12th ANNUAL HEALTH EXHIBIT**

**Fort Worth, Texas, October 27-30, 1930**

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# American Journal of Public Health

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### Pre-disaster Preparedness\*

CONSIDERING the various public health phases of disaster relief it can best be handled by sub-division into three sections: Pre-disaster Preparedness, Emergency Relief, and Post-disaster Relief (rehabilitation). The committee proposes to consider each as a unit and presents herewith pre-disaster preparedness as relates to the public health engineering aspect of disaster relief.

Disasters affecting cities, towns or rural areas can be classified as to causes:

1. Floods, overflows, water damage, tidal waves
2. Fires, conflagrations, forest
3. Wind, tornado, hurricane, coastal gales
4. Explosions, munitions, factories, mines, institutions
5. Drought, water supply failures
6. Disease outbreaks
7. Earthquakes

Any or several of these types of disaster may bring up problems where the mature judgment of the engineer may be of utmost importance in arriving at a prompt, effective solution.

Disasters are no longer minor or chance occurrences, but each year they are more widespread, more devastating, more demanding of the harmonious assistance of such agencies as:

1. Official, Governmental Agencies:
  - Federal, State, County and City Health Departments
  - State Militia or Police organizations
  - U. S. Army, Navy and Coast Guards
  - Agricultural, Mining, Forestry Departments
2. Official Relief Agencies:
  - National or local American Red Cross
3. Unofficial Agencies:
  - American Legion
  - Salvation Army
  - Religious and Fraternal Orders

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\* Report of the Committee on Disaster Relief, presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 2, 1929.



The problem of harmonizing forces prior to disaster is worthy of our best efforts, and it is hoped that this report may stimulate some thought, if not action.

#### STATE DISASTER BOARD PLAN

Primarily any relief work is governed by the finances available, and it is recommended that for states where disasters are of common occurrence there be available through legislative appropriations an emergency fund of at least \$50,000, at the disposal of the governor, to be used only in disasters of magnitude such as floods, conflagrations, hurricanes, disease outbreaks, etc., as determined by law. Such a fund should be dispensed only through state employees, and a State Disaster Board is suggested to consist of:

The Governor as Chairman  
Adjutant General  
State Comptroller  
State Highway Commissioner  
State Health Officer  
Public Service Commissioner or Utility Representative  
State Commissioner of Welfare  
American National Red Cross representative appointed by Washington Headquarters

Partial allocations of funds, equipment, and duties, could be made in advance for emergency work and thrown into operation by direction of the governor. After a preliminary field check of losses and conditions, a meeting of such board could allot specific items, plan procedure, and get under way with very little lost motion. Pre-disaster preparedness would indicate authorized characters and methods of expenditures of funds.

1. In presenting a State Disaster Board plan it is appreciated that local conditions will indicate the structure of such a board, and that such a board is not an organization to function all the time, but merely a board of known components called into service at the will of the governor, who as chief executive should head the board.

2. The Adjutant General directing the National Guard or Militia should be a member, to determine the use and function of militia units. In disasters of great magnitude, involving several cities or counties, militia units from nearby points should be called in to assist local civil authorities in the protection of property, regulation of traffic, preservation of order, and similar police matters. The use of National Guard property such as tents, camping equipment, medical and other supplies, radio transmission outfits, etc., may be necessary and can best be administered by Guard personnel. If necessary, any area may be placed under military control and administered under martial law, but such action is not recommended.

3. The state comptroller should designate the manner in which emergency financial matters are to be handled.

4. The state highway commissioner might be instrumental in securing transportation and crews of laborers from other parts of the state so that roads may be reopened, bridges and automobile traffic restored. State trucks can well be used for emergency work, handling supplies, equipment and perhaps the dead.

5. The state health officer should be a member of the board because of the increased possibilities of spread of communicable disease under conditions created by disasters, and the importance that the press and general public attach to the aftermath of a disaster with its sudden change in the ordered life of thousands of people. He should be the executive head of all health matters, acting, however, only in coöperation with established local health agencies, or where such an agency does not exist or is incapable of proper functioning.

6. The state public service commissioner or representative of the power, communication, or transportation utilities, should be on the board to determine the action of such utilities. Such a representative should be acceptable to the interests and they should agree to obey his orders in disaster time.

7. The State Welfare Commissioner may in some instances exercise board powers as to housing, and his assistance may be of great value in the rehabilitation program including, as it may, use of convict labor, placing of orphans in institutions, etc.

8. A representative of the American National Red Cross appointed by Washington should be on the Board to make plain the limits of Red Cross participation in the relief program and to establish harmonious relations. This is especially desirable if disaster strikes in a community which has no official governmental or Red Cross organization.

Such a board can be extended to cope with any disaster, depending upon the local conditions of government. The plan is advanced to provide for instant and effective action in an emergency and to correlate the work of state agencies with that of the American National Red Cross. Though the American National Red Cross is the official disaster relief agency, chartered by the federal government, among other things—

. . . to continue and carry on a system of national and international relief in times of peace and to apply the same in investigating the suffering caused by pestilence, famine, fire, floods and other great national calamities and to devise and carry on measures for preventing the same . . .

nevertheless there are certain things which we might expect, which it will not do, even though it would materially aid in establishing conditions greatly affecting the morale, health and welfare of the stricken people. In the field of public health the policies are rapidly becoming reorganized under William DeKleine, M.D., Director of Medical Service, an official experienced in the problems confronting the public health officer.

The foregoing is intended to provide the background for the work of the public health engineers. Considering the state as a unit, the engineer of the state health department is usually the keyman for immediate field action necessary to protect the public health. He therefore should be charged with the pre-disaster organization of all engineering and sanitary personnel and procedure.

#### THE PROBLEMS

The problems involving engineering activities in the mentioned types of disasters are:

- Provision of emergency housing accommodations
- Provision of necessities of life, such as, water, food, including milk and ice and waste disposal
- Handling of refugees—creation of good morale
- Disposal of dead—human and animal
- Rehabilitation of families

In each, the engineer has a vital part. For emergency housing the availability of such structures as schoolhouses, especially those equipped with cafeteria facilities, churches, parish or Sunday school rooms, gymnasiums, etc., armories, warehouses, ball parks, race tracks, fair grounds, auto tourist camps, etc., should be known. These could be used temporarily for refugee or labor camps. No place should be considered unless safe drinking water under adequate pressure is available or can easily be made so. Tent camps for refugees are not desirable and unless absolutely necessary should not be used. The engineer should be able to establish, or tell those who desire to establish a camp where it can best be located, where safety from inundation is assured, good drainage available, safe water supply under pressure can be had. The transportation of foodstuffs into the camp must be considered. Good excreta disposal is essential and should be provided at the earliest possible moment. Pit privies must be furnished in the absence of sewerage. Shower baths should be installed promptly.

Dr. DeKleine says:

The organization of refugee camps, emergency hospitals and the like are, I believe, functions of the Red Cross although . . . the selection of the site and sanitary regulations should meet the requirements of the local and state health departments. Their advice should be sought wherever possible.

Provision must always be made to protect the refugees or laborers in camps from insects pests whether they transmit disease or not.

Water service should be restored at once and the engineer should be able to assure the public at the earliest possible moment that the

supply is available and safe. Great care should be exercised in condemning a supply or advocating the boiling of water for drinking purposes. The harm done to the morale of the people and the danger of their using water more unsafe than the public supply should be weighed against its chance pollution. The engineer should arrange beforehand for running transmission lines to the water works, thence to the hospitals, milk plants, emergency housing structures, etc. Standby gasoline engine or electric generating equipment should be part of every water works, but if not available, fire engines can be used if emergency couplings are available. Plans for chlorination should be made, but care taken not to create tastes or odors which would lead people unaccustomed to chlorinated water to seek other sources of supply.

In rural sections the use of chemical sterilization is recommended and full utilization of bottled water supplies in the area should be planned. Chlorination should be done at the plants. Water can often be shipped into the area in tank cars, and provision should be made in advance with the railroad officials (water supply department) for the prompt handling of such shipments from approved sources. These should be chlorinated in the car at the source.

For staple food supplies the engineer need have little worry as they will be forthcoming. In time of disaster milk preferably should be canned or dried. The engineer should know the character and capacities of available pasteurization equipment, for medical officers, or the local authorities, may order all milk pasteurized when the local plants can handle only one-tenth of it. Preliminary agreements with the railroads should be made to have express service given to shipments of water, milk, ice, perishable foodstuffs and urgent supplies. Special marking tags might be developed to expedite shipments.

Waste disposal can rarely be planned in advance but ordinarily pit privies can be planned for, or the restoration of plumbing service. If the plumbers can be approached in advance there is a possibility of securing a detail from a nearby town to make temporary repairs.

Creation of good morale among the citizenry, and handling of refugees, are problems that the engineer has little to do with, but he can be of great assistance in explaining to excited councilmen, committees, etc., the simple facts of disease transmission. The engineer has to meet all conditions arising, always bearing in mind that optimism is worth a lot in times of disaster. In disasters of large magnitude the engineer may be called upon to assist in gathering and disposing of the dead. His knowledge of soil and topographical conditions may indicate to him what method of procedure—burial or cremation

—is possible. Animal bodies can best be disposed of by incineration, using wood débris and oil. Burial may be used if topographical conditions permit.

#### PERSONNEL

The engineer should know definitely where persons are who might be listed as available when needed; how long they can be kept on duty; and how their services may be obtained. Among the needed personnel may be listed:

1. Trained Public Health Engineers and Sanitary Inspectors:
  - State, county, city, or district departments
  - Federal, U. S. Public Health Service
  - On staff of large utilities or manufacturing plants
2. Plant Operators:
  - Water plant employees, filter men, chemists, pump men, etc.
  - Milk plant pasteurization operators, etc.
  - Sewage treatment plant operators

In the time of disaster, assistance can be called for from men who are in some measure in touch with the local conditions; who appreciate the natural conditions of the area, who know how to handle very similar problems. Thus for a disaster affecting one area, the first call for personnel should be made upon men within that state or nearby states. Full utilization of local (state) personnel should be made before outside assistance is sought.

The engineer should have available a list of those who can be mobilized and to whom the request for such assistance should be sent. It is also of vital importance to know just how long such assistance should or can be kept without incurring financial obligations. Often men will be freely loaned by their employers for the emergency, but after the glamour of relief work disappears and routine is established that "going home" call must be met. Definite understanding must be had as to the duration of service of drafted personnel, and in every case it should be definitely understood that no man is to leave his post until relieved by orders from the official in charge. Otherwise a trained water works operator may be detailed on a plant and left in charge, and perhaps two days later one may find him gone and the plant running by itself. Preliminary understanding is the only way to handle volunteer service.

Necessary labor should be carried on a regular pay roll and no dependence placed upon volunteers of the laboring class. Twenty-five paid laborers are worth more than 250 volunteers, and provisions should be made for prompt hiring and paying of such men from the state funds. This turns loose the money so needed in a devastated

area. A few dollars in the pockets of a man who has lost all is a tremendous factor in restoring courage and morale.

Here it might be wise to mention the policy of the Wallace and Tiernan Company with regard to disaster relief work. Every field representative of this company is directed to report in person to the chief engineer of the state board of health having jurisdiction, equipped with such supplies and materials as are available, and to place himself and equipment at the orders of the chief engineer. Such a policy is to be commended.

#### SUPPLIES AND EQUIPMENT

In the matter of supplies and equipment, each engineer will have to consider what are needed, where they can be obtained most quickly and who will pay for them. Such supplies are:

1. Chlorine control apparatus, gas and orthotolidine for water and sewage sterilization
2. Hypochlorite and similar materials for household, field or small plant use
3. Automobile and railroad tanks for transporting water and location of acceptable supplies
4. Gasoline engines, portable electric pumps and generators for pumping water
5. Water storage tanks, 5-gallon glass bottles, milk cans, field workers' canteens
6. Outboard motors, trucks capable of negotiating flooded roads
7. Disinfectants, hydrated lime, cleaning compounds, commercial preparations, deodorants, oils for mosquito work, etc.
8. Insect repellents, sprays, etc.
9. Tents, barracks, armories, race tracks, warehouses
10. Camping equipment, cooking and eating utensils, wire screens, blankets, mosquito nets
11. Milk plant supplies, thermometers, etc.
12. Fuel, oils, gasoline, canned heat for field use
13. Incidentals, flash lights, raincoats, high boots
14. Disaster data

Each engineer should study his area carefully and check it at least yearly. A small supply of materials might well be kept on hand especially for the sterilization of water. It is also thought advisable to have a supply of what may be called "disaster data booklets," devoted to the type of disaster prevalent in each state, to be distributed among the population affected, telling in simple language the facts of disease prevention in time of disaster and assuring the people in no uncertain terms that odors, from dead animals, for example, will not "breed disease," that cholera will not break out suddenly because of the overflow of land, etc. Some statements as to disinfectants, their use or

abuse, would be welcome. Public health workers are often too fearful of results, whereas in times of disaster the morale of the public must be restored and their fears allayed. If one is hesitant about statements the public soon loses faith in him. Directions must be simple and easily understood, and capable of being carried out under disaster conditions. Outboard motors, resuscitation apparatus, oxygen hoods, pulmotors, gas masks and such equipment should be available to some state agency, or the knowledge of where it can be obtained known to the engineer.

The engineer in disaster relief must be one of the workers as well as an executive; he must know the people who will be found on the job at such times. He should prepare for disaster by having many close friends who are in key positions with utilities, relief organization officials, etc. He should be an active member of such organizations as the American National Red Cross, and American Legion. Membership in the clubs such as Rotary, Kiwanis, etc., is invaluable, for through such organizations desirable contact is established throughout the state. Fraternal organizations are also of value. The wider his acquaintanceship, and knowledge of his state or city, the better it is for him in time of disaster. Friendship is the best shear for cutting red tape and getting to the right person. Advance information as to courses of storms, height and approximate time of overflow, etc., can often be secured from:

1. Official Governmental Bureaus, Weather, Forestry, Mining, War and Navy Departments, Engineering Offices
2. Public Relations Officers of Railroads, Utilities, Telephone Companies, Radio Companies, etc.

Governmental airplanes can sometimes be had to make a rapid reconnaissance and preliminary estimate of the situation. Maps of all descriptions, including railway right-of-ways, maps of levees and drainage districts, etc., are of value in locating high areas for camp sites.

#### PREPAREDNESS

In every state there are communities having American Red Cross chapters. These chapters are given charters defining the territorial limits within which they can operate. In some states there are large areas in which there is no Red Cross organization or territorial responsibility. It is suggested that some plan could be devised by subdividing the state into districts, and assigning to the local chapters the responsibility for carrying relief in event of disaster within their area rather than limiting their action to charter definitions. In this way rural disasters could be more easily handled. Each Red Cross chapter

should have a local Disaster Preparedness and Relief committee (see A. R. C. No. 209—*When Disaster Strikes*); with sub-committees covering food, clothing, housing, transportation, medical aid, etc.

The engineer should know the functions of these committees and their availability—they are valuable aids to him in any preparedness work and he should use them.

Local health departments should be organized for disaster relief work and their organization may be patterned after that of the state health department. Especially should the local health department have its staff working in harmony with all relief agencies and the time to establish cordial relations is before disaster strikes.

The need for state health departments to be prepared for disaster duties is becoming more apparent every year. The public health problems that follow in the wake of every storm and flood are often staggering, and unless health departments are prepared serious difficulties may be expected. The midwestern tornado of 1925, the Mississippi flood of 1927, and Florida's hurricanes of 1926 and 1928, are illustrations. Each state health department should be organized to handle its own emergency problems. Outside agencies may offer assistance when health departments are not able to cope with the problems; but each health department must realize that public health supervision is its responsibility.

Disaster preparedness should be considered as a public health necessity by every state health department, as well as an opportunity to render better service. The State and Provincial Health Officers and the American Red Cross have given this subject much study. It is therefore recommended that this Association take some definite steps to develop a program with the various official agencies.

The engineer is but a part of a health organization though fortunately he is alert to the call of danger and never fails to answer. He has an opportunity to blaze the way by organizing his own department on a disaster relief program and then selling his ideas to his chief. The problem is not a small one—it is worthy of the best of us. It is an amazing opportunity for real constructive service. As engineers we have a definite part in the program, and we offer our coöperation and services to similar committees of other organizations such as the American Red Cross, which has no engineering personnel.

#### AMERICAN NATIONAL RED CROSS POLICY

What can be expected of the American National Red Cross in matters of interest to the engineer? Dr. DeKleine stated before the State and Provincial Health Authorities of North America:



The Red Cross deems it important that every sound and practical public health measure which will contribute to the immediate health and well being of the people of the disaster stricken area shall be utilized to the fullest extent. It is willing to assist local health agencies in this effort and contribute the additional personnel, supplies and facilities which they lack or cannot otherwise secure. . . .

Financial and other assistance will be given when the official health agencies are not able to cope with the problem, for reasons already mentioned, and when it is clearly indicated that such assistance is needed and wanted. Where health departments do not have and cannot otherwise secure sufficient funds or personnel the Red Cross will purchase or otherwise provide the supplies and facilities necessary, and help secure the additional personnel.

The Red Cross will make every effort to maintain a friendly and coöperative relationship with all the medical and health agencies and endeavor to coördinate all the health activities in the disaster area.

E. L. FILBY, *Chairman*  
J. H. O'NEILL  
E. A. REINKE  
H. F. FERGUSON  
A. F. ALLEN

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## Antivivisection

THERE are many "Anti"-bodies, apart from those which save us from disease. Some of them are good, most of them are bad. I cannot bring myself to object to anti-aircraft guns, and there is probably much to say for the anti-Saloon league. Anti-dazzle, anti-fire, anti-germ, anti-vibration, anti-waste, and anti-slavery (to quote the telephone directory), all sound beneficent enough. In anti-prohibition, however, anti-socialist, anti-communist and anti-vaccination we begin to tread on the dangerous ground of propaganda; while in London the anti-mind is revealed, in its highest form, in four separate and independent anti-vivisection societies, all fighting against one another in the same great cause. This anti-mind is no new phenomenon. In my recent researches I came upon an Anti-Rail-Road Journal dated 1835. The Editor claims, as Dr. Hadwen would, that he is "fighting only on the side of truth," "on behalf of some of the most valuable, but least defended interests." This journal contains "an exposure of the Railway System," and it is interesting to record that the list of those who subscribed to a pamphlet "Rail-Road Impositions Detected" is headed by the Provost and Fellows of Eton College, followed by fifteen canal companies, three steam waggon companies, several public houses, and a representative of Messrs. Pickford, carriers. The high ideals professed, and the flowery language employed, by the anti-rail-road enthusiasts of 1835 are so similar to those of anti-vivisection to-day that there are grounds for the hope that the future of both may be the same. . . . I admit—to its credit—that the Anti-Rail-Road Journal avoided calling upon the Almighty to bear witness to the purity of its motives; the Anti-Vivisectionists have not the same compunction.—From "Enemies of Knowledge," by Professor A. V. Hill, *The Quarterly Journal of the Research Defence Society*, Summer, 1929, p. 8.

# Public Health and Medical Problems in Disasters\*

WILLIAM DEKLEINE, M. D., F. A. P. H. A.

*Director, Medical Service, American National Red Cross, Washington, D. C.*

THE American Red Cross is a disaster relief agency chartered as such by the federal government. The Congressional Charter, under which it operates, charges it, among other things, with the duty —“to continue and carry on a system of national and international relief in time of peace and to apply the same in mitigating the sufferings caused by pestilence, famine, fire, floods and other national calamities, and to devise and carry on measures for preventing the same.”

Funds for maintaining the Red Cross organization are, however, not obtained through governmental sources, but entirely through voluntary subscriptions. It is therefore a semi-official agency. Its duties in disasters are official, but the financial support for all its activities is voluntary.

The Red Cross functions in the field principally through the medium of local chapters, of which there are about 3,500 in the continental United States, 10 in our insular possessions and neighboring islands. Where chapters are prepared for disaster duty, they generally assume the leadership in the emergency relief work. Chapter preparedness is one of the objectives of the national organization. Such communities, therefore, conduct their own relief work at least until it is determined that outside assistance is necessary. The national organization participates in the relief program only where communities are not able to cope with the situation, or where assistance is urgently needed or requested.

Red Cross relief in disasters is not based on the loss sustained by individuals or families, but on actual need only. Relief is intended primarily for the emergency needs of those who are in distress—to feed, clothe, and shelter them temporarily; to safeguard their health; to provide medical, nursing and hospital care; to assist them in rebuilding their homes and to help restore normal living conditions. Those individuals and families who are able to cope with the situation without material assistance are expected to do so.

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\* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 2, 1929.

There is, however, an emergency period during which it is difficult and often impossible to distinguish the one from the other. The situation is often so very critical that assistance must be given to every one who appears to be in need. That applies to medical as well as to other forms of relief. The necessities with which to sustain life and health must be provided promptly for all, and must be continued until the critical period has passed. There is no time to investigate.

Every effort is made to organize the relief work as early as possible on the basis of actual need. All families and individuals who are receiving help, or may need it, are registered; their circumstances are carefully investigated; and relief continued only for those who deserve it. Rebuilding the homes and other rehabilitation problems are matters that require careful investigation and study before awards are granted for that purpose. In Red Cross language, this phase of relief work is designated as the rehabilitation period.

The emergency period may last only a few days, or continue for several weeks. Refugee camps are generally necessary in large disasters. They are hurriedly set up in buildings or in army tents. Food must be provided through community kitchens and canteen service. Those seriously ill and injured are taken to hospitals in the community, or in neighboring cities. Medical and nursing service, emergency medical stations and increased hospital accommodations must frequently be provided, and measures instituted for the protection of the public health. These are emergency needs and must be provided promptly.

The public health and medical problems are not limited to the emergency period. Many of them extend over considerable time and new ones may develop several weeks after the disaster. There may be a sudden increase in illness among the disaster population. Pneumonia and other respiratory infections are not uncommon. Typhoid fever caused by contaminated water, scarlet fever, measles, and small-pox resulting from overcrowding, may occur in epidemic form. Dysentery, particularly in tropical climates, and malaria may increase. Special maternity service must sometimes be provided particularly where the disaster involves a large number of families as in the Mississippi flood. These problems frequently hinder the progress of the rehabilitation program and must be solved before normal living conditions can be restored.

There are two major health problems in nearly every large disaster—safeguarding the health of the disaster area, and providing medical care for the sick and injured. From an administrative point of view these are distinctly separate problems and must be so regarded in

organizing the relief work. The first is the duty of the constituted health authorities; the second is the function of the local medical profession and hospitals.

The Red Cross does not sponsor or direct the health activities in a disaster area; neither does it assume the responsibility for the care of disaster patients. These are clearly the duty and function of local agencies. If, however, communities have not adequate health service, or if the medical, nursing and hospital facilities are inadequate, it is the duty of the relief agency to assist them. There is no attempt to supersede local agencies. The Red Cross can render the best public health and medical service in disasters, we believe, not by sponsoring these duties, but by providing for the local health authorities and medical profession the supplies, facilities and personnel which they lack and need for the emergency.

It is important that every sound and practical public health measure which will contribute to the immediate health and welfare of the people in the stricken area is utilized to the fullest extent. The sudden change from normal life in the home to crowded and often unsanitary conditions in refugee camps and other places of shelter; the contamination of water supplies, particularly in floods; the increased area of stagnant water in districts already infested with malaria; diarrheal diseases, especially in tropical climates; and other problems demand serious effort on the part of public health officials. Much unnecessary illness can be prevented if prompt action is taken and if the public health work is organized and conducted on the basis of sound public health policy and procedure. Incidentally, a disaster affords an excellent opportunity to educate the public to the advantages of adequate public health protection.

The Red Cross endeavors to coöperate in every way possible with the local medical profession and to assist them in the difficult problems which confront them. It aims to provide for them what they lack and need for the emergency. In organizing the medical relief work, every effort is made to maintain and restore a normal relationship between physicians and patients. Preference is always given to local physicians when it is necessary to employ them for duty at emergency stations, refugee centers, or to assist health departments at immunization clinics.

Where disasters cover a large territory, additional medical and public health personnel are frequently required, to assist in the administrative duties, and to help make a survey of the critical needs of the area. Representatives of the U. S. Public Health Service, the Medical Service of the Army, and physicians with previous disaster

experience often assist in these duties. It should be understood, however, that they are used primarily for the purposes indicated and not for giving medical care to disaster patients, or for local public health duty.

The direction and supervision of the nurses employed by the Red Cross for disaster duty cannot be delegated to any other agency. Because of the large numbers frequently employed, and because of the nature of their work, it is necessary that they be directed by the Red Cross Nursing Service. Through direct contacts with the home, they are frequently able to obtain information most valuable in determining the real need of many families. It is therefore important that a very close liaison be maintained between the Nursing Service and other Red Cross divisions. This is not possible unless they are directed and supervised by the same agency.

The public health and medical activities in which the Red Cross is most frequently called upon to assist or participate may be summarized as follows:

1. Providing additional personnel—physicians, public health nurses, sanitary engineers and sanitary officers—to assist health departments and to staff emergency medical stations, emergency hospitals, and refugee centers. The nurses provided by the Red Cross generally serve the dual purpose of assisting in public health nursing and in bedside care of disaster patients in the homes and hospitals.

2. Sanitation of the disaster area—This includes examination of the public and private water supplies, the adoption of measures to insure safe drinking water and food supplies, the disposal of dead bodies and other sanitation problems.

3. The control of communicable diseases—This includes the usual measures such as isolation in the home, hospitalization and immunization. The immunization of susceptible individuals against typhoid and smallpox is generally an important public health activity in disasters.

4. Providing additional hospital facilities—This is accomplished either by expanding existing hospitals, or by establishing independent emergency hospitals in suitable quarters. The latter are set up only where there are no local hospitals or where expansion is not possible or desirable. Tent hospitals are used only as a last resort. Provision must sometimes be made for the care of maternity cases.

5. Establishing emergency medical stations and dispensaries at refugee centers and other convenient places where disaster patients may apply for medical care.

6. Providing public health and medical supplies for use by the health agencies, physicians and nurses. Smallpox and typhoid vaccines, tetanus and diphtheria antitoxin, bandages, surgical dressings and a variety of medical and surgical supplies are generally necessary.

7. Medical and nursing supervision of refugee centers—The care of individuals temporarily housed in refugee centers is a definite responsibility of the Red Cross.

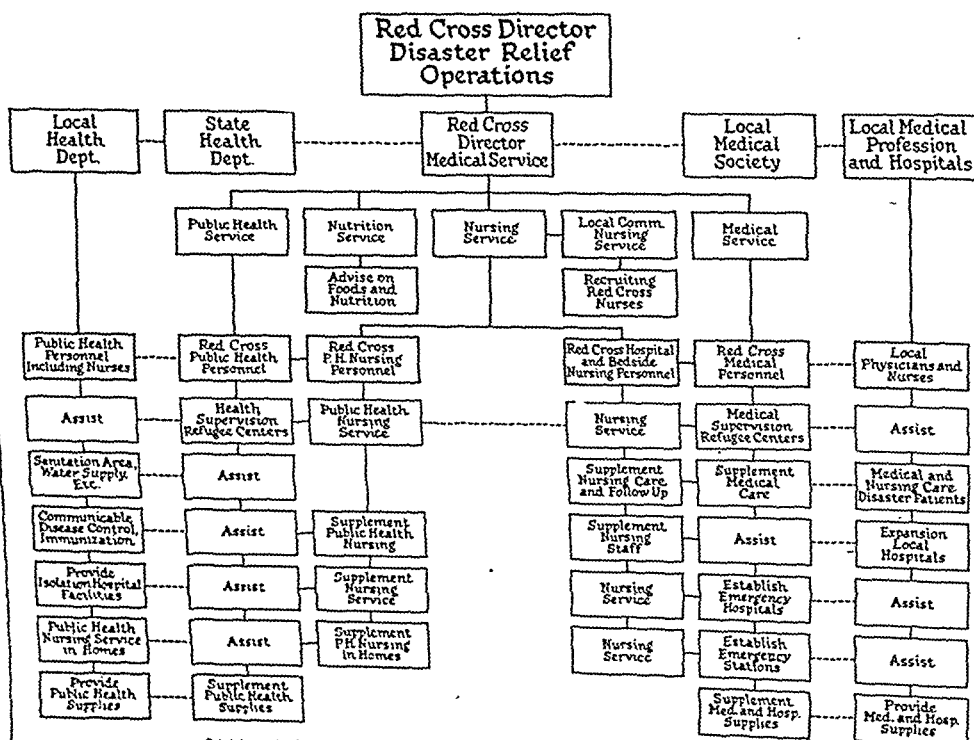
Refugee camps, emergency stations, and emergency hospitals directed by the Red Cross are, for all intents and purposes, Red Cross families or centers. That is especially true of refugee camps. The

Red Cross is responsible for the administration of the affairs of these centers. It provides the necessities with which to sustain life and health and—what is more—it pays the bills. It must also accept certain responsibilities for the health supervision of these camps, and for directing the medical and nursing services.

This should not be interpreted to mean that local physicians and official health agencies do not have access to these centers and have no responsibility toward individuals temporarily under Red Cross care and supervision. Physicians are expected to maintain the same relationship with disaster patients in camp and in emergency hospitals as with those outside. The public health officials must exercise the same authority and relation toward Red Cross centers of this character that they do, in normal times, toward other institutions or families where a large number of people are housed. The enforcement of laws and regulations governing the control of communicable diseases, the immunization of individuals in camp as well as those outside, and similar duties must be assumed by the official health agencies.

The Red Cross must, however, assume certain definite responsibilities for the health supervision of these centers and for certain

## Public Health and Medical Service in Disasters



Solid lines indicate Administrative Control - Dotted lines Correlation of Agencies and Services.  
 \*Assist\* indicates that supplementary service (without Administrative Control) is available for the activity specified in opposite space connected by a dotted line.

medical and nursing duties. The communicable diseases must be promptly identified and isolated; isolation facilities must be provided; kitchens, buildings and grounds must be kept clean and the food supply protected against contamination; adequate toilet, bathing and laundry facilities must be provided; and the general sanitary standards and regulations of the local and state health departments carefully observed. These are definite responsibilities of the Red Cross health and medical service.

The accompanying chart attempts to show the administrative set-up of Red Cross public health and medical activities in disasters, and how each division functions in relation to local health departments, the medical profession and the nursing and hospital services. The chart does not attempt to outline the activities of health departments or other local groups, but outlines only Red Cross duties and indicates how they are correlated to the activities of local agencies.

It is of prime importance that health department and Red Cross public health activities in disasters are carefully coördinated. There should be no overlapping or duplication of services, or misunderstanding of purpose. This necessitates bringing these agencies together to study the problem; to formulate policies and working agreements; to define the function and duties of each; and to prepare routine inter-relating procedures. Unless this is done we cannot hope to have one public health program in disasters.

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## Mexico Child Health Work

THE Division of Infant Hygiene, *Service de Higiene Infantil*, was established by the Federal Department of Public Health of Mexico early in 1929. In recent years this department also established prenatal clinics in the capital and in the states. Child health centers have been in existence since 1921, and since the organization of the Division of Infant Hygiene, 5 new child health centers have been established where prenatal advice is also given. The centers, situated in the poorer districts, all have modern equipment and are staffed with physicians and nurses. Treatment in case of illness is also given to mothers and children, although the main purpose is the prevention of illness. The Division of Infant Hygiene also maintains a staff of visiting nurses who visit the mothers to see whether they comply with the physicians' directions and to persuade them to attend the centers regularly. A school of child care (*Escuela de Puericultura*) is maintained, in which courses are given for physicians, nurses, school teachers, and housewives.

The Division of Infant Hygiene is also coöperating with the *Asociación Nacional de Protección a la Infancia*, a recently organized private society, which maintains a maternity home and several nurseries and is planning to establish new child health centers. This association has established child health agencies in various states.—*El Niño, Revista Mensual*, Mexico City, Jan., 1930, p. 64.

# Bacterial Aftergrowths in Water Distribution Systems\*

THE Committee on Water Supply has directed its efforts during the past year largely to a consideration of the above subject. It is known that a few cities throughout the country are having trouble with what appear to be growths of *B. coli* in the water after it leaves the purification plant, or the point where the water is chlorinated. The *B. coli* content of the water in some cities has, at times, been found so high in certain parts of the distribution system that it leaves doubt as to the safety of the water for drinking purposes. This is especially true where the *B. coli* content is the sole standard of quality.

Consideration is given here to causes of aftergrowths and not to pollution. Any water may become polluted if the proper protections are not provided, but it is believed that there must be some special condition to cause *B. coli* to increase materially in water. We hope that finding the conditions under which it will increase will enable many cities to apply a remedy.

To obtain some idea of the extent of troubles from bacterial aftergrowths, a questionnaire was sent to 90 cities throughout the country. Forty-eight replies were received, most of which were from the larger cities. The estimated population of those to which the questionnaire was sent is about 30 millions, and the 48 replies were from those having a combined population of 25 millions. No attempt was made to make the questionnaire complete. The committee desired most of all to find places where aftergrowths were occurring. The replies may not represent the actual conditions in many instances, but give some information of value. Fourteen cities, with an estimated population of nearly 16 millions, reported that they were having or had had trouble from bacterial aftergrowths. A few others reported increases in bacterial counts after some disturbance in the mains, or occasionally in dead ends.

The following is a brief digest of the essential facts as reported by the cities having trouble from bacterial aftergrowths, or which would have trouble if the water were not treated especially to prevent them:

*Albany, N. Y.*, has 2 open reservoirs with capacities of 7 and 30 million gallons. They are lined with brick with riprap at the top. The storage periods are about

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\* Report of the Committee on Water Supply, presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 1, 1929.



½ day and 2 days. The water levels are above the level of the surrounding ground. Microorganisms do not grow abundantly in the reservoirs and they are not being treated to prevent such growths. The bacterial increase in the distribution system is not due to cross-connections with polluted supplies.

"There is no question but that the increase in coli in the distribution system comes from coli entering the open reservoirs from fecal matter from rats, birds, and swimmers that make use of the reservoirs, notwithstanding the fact that they are well lighted and patrolled up to 11 P.M. The increase in coli starts in May with the advent of warm weather and persists well into October when the water cools. The filtered water entering the reservoir has been free from coli for 5 years in 10 c.c. portions. The water in the mains served by the reservoirs shows the presence of confirmed coli in 75 per cent of the 10 c.c. portions."

*Baltimore, Md.*, has 8 open reservoirs with capacities of 5, 15, 20, 22, 24, 35, 195 and 500 million gallons. Four of the reservoirs are lined with concrete and 4 with stone riprap. Six have the levels of the water above that of the surrounding ground and 2 have the ground above that of the water on two sides. The 500 million gallon reservoir is not in regular service. The water is treated with hypochlorite of lime for the reservoirs in use. When the large reservoir is used the water is chlorinated. There is no excessive pollution from the air. Microorganisms would grow in some of the reservoirs, but such growths are kept down by the hypochlorite of lime or by copper sulphate. Cross-connections with private supplies are not permitted.

*Buffalo, N. Y.*, has 1 open reservoir with a capacity of 116 million gallons. It is lined with stone. The storage capacity is about 2 days. The water level is above that of the surrounding ground. There is the possibility of pollution from the air. Algae do not grow abundantly, and the reservoir is not being treated. The *B. coli* in the distribution system is not due to the reservoir.

"Marked increases in the bacterial counts in the distribution system occur during the summer months when the temperature of the water runs between 65 and 72° F. By increasing the normal average dose of 0.20 p.p.m. of chlorine to an average of 0.30 p.p.m. the growths are kept well in control."

*Charleston, S. C.*, has 1 open reservoir with a capacity of 2.5 million gallons. It is lined with brick. The water level is above that of the surrounding ground. It is possible for the water to be polluted from the air. Algae grow during the summer months. The reservoir is not in regular use, and when used the water is sterilized. Occasional increases in the bacterial counts are attributed to breaks in the mains or to heavy drafts such as may be caused by fires.

*Chicago, Ill.*, has no open reservoirs. The water is chlorinated at the pumping stations to the extent that residual chlorine extends over the entire distribution system. If this were not done there would be bacterial increases beyond the zone of residual chlorine.

*Cincinnati, O.*, has 2 open reservoirs with capacities of 35 and 96 million gallons. The water level is above that of the surrounding ground for the 35 million gallon reservoir and below for the 96 million gallon reservoir. There is not much pollution from the air. Water from the larger reservoir shows considerable increase in *B. coli* from about April to November each year. This reservoir has fairly abundant algal growths during the warmer months. The bacterial results for 1927 and 1928 are summarized in Table I. Clarence Bahlman gives additional information on bacterial increases.<sup>1</sup>

TABLE I

COMPARISON OF PRESUMPTIVE *B. COLI* INDEX PER 100 C.C. IN PLANT OUTPUT,  
HIGH SERVICE AND LOW SERVICE DISTRIBUTION SYSTEMS,  
CINCINNATI WATER WORKS

Month	Plant Output	1927		Plant	1928	
		High Service	Low Service		High Service	Low Service
Jan.	0.36	0.00	0.16	1.13	0.23	0.69
Feb.	0.11	0.00	0.05	0.58	0.00	0.69
Mar.	0.00	0.00	0.00	0.19	0.73	0.38
Apr.	0.33	0.33	0.16	0.10	1.09	1.17
May	0.03	0.83	1.33	0.00	0.00	2.94
June	0.10	0.15	1.64	0.20	0.15	4.14
July	0.00	0.33	2.14	0.45	0.00	3.89
Aug.	0.23	0.46	2.20	0.42	0.55	2.84
Sept.	0.37	0.13	1.08	0.17	0.80	1.65
Oct.	0.13	0.62	1.95	0.03	0.33	1.19
Nov.	0.03	0.00	1.81	0.43	0.22	0.85
Dec.	0.29	0.15	0.46	0.13	0.00	0.30
Av.	0.17	0.25	1.08	0.32	0.34	1.73

*Detroit, Mich.*, has no open reservoirs, but there are occasional bacterial increases in the dead ends.

*New York, N. Y.*, has 13 open reservoirs (2 not in use) with capacities up to 1,000 million gallons. Some are lined with concrete, some with brick, and some with clay or mud. The water levels are above that of the surrounding ground. They are occasionally polluted from the air by smoke, street dust, sea gulls and other birds. Microorganisms grow abundantly at times. The water is treated with copper sulphate when necessary. Water from the reservoirs occasionally shows an increase in *B. coli* in the late summer. *B. coli* and *B. welchii* are present in the mud at the bottom, growing on organic matter such as dead microscopic organisms. *B. coli* is present in the sediment of all mains. Any disturbance of the flow will cause *B. coli* to appear in the taps.

*Pittsburgh, Pa.*, has 7 open reservoirs with storage of about 3 to 3½ days. The reservoirs are lined with concrete, and the water levels are above that of the surrounding ground. Bacteria increase in only one section of the city. Microorganisms do not grow abundantly in the reservoirs. The water in the reservoirs is not being treated. Cross-connections with private supplies are not responsible for the increase in bacteria. There is no evidence that the open reservoirs are responsible for the increase.

*Philadelphia, Pa.*, has 3 open reservoirs with capacities of 40, 70, and 680 million gallons. They are lined with asphaltic coating on brick or concrete. Two smaller ones are balancing reservoirs, and the large one is a storage reservoir which is not in regular service. The water levels are above that of the surrounding ground. The balancing reservoirs feed only a small portion of the system. Bacterial increases occur only when the system is disturbed, or when the water is drawn from the storage reservoir. Microorganisms occasionally grow abundantly in the reservoirs in hot weather. There is no pollution from cross-connections. Copper sulphate is used occasionally in hot weather. Water from the large storage reservoir is chlorinated when used.

Washington, D. C., has 4 covered reservoirs with capacities of 8 million gallons each. They are lined with concrete, and the water levels are above that of the surrounding ground. Bacteria do not increase to any extent in the distribution system. One open reservoir, now out of service, formerly caused bacterial aftergrowths. Carl J. Lauter gives a detailed account of the aftergrowths caused by this reservoir.<sup>2</sup>

*City No. 1*—There are 7 open reservoirs with capacities ranging from 2 to 4 million gallons. They are lined with masonry, and the water levels are above that of the surrounding ground. Microorganisms do not grow abundantly in the reservoirs. There are occasional increases in the bacteria. The water in the reservoirs is chlorinated intermittently. There are no cross-connections.

*City No. 2*—There is 1 open reservoir with a capacity of 14 million gallons. It is lined with concrete, and the water level is above that of the surrounding ground. Microorganisms grow in the reservoir, but it is chlorinated to prevent such growths. There is no pollution from cross-connections. For the year 1928, 11.2 per cent of the 10 c.c. tubes from the reservoir showed *B. coli*, whereas only 1.6 per cent of the 10 c.c. tubes from the water delivered to the mains showed *B. coli*.

*City No. 3*—There are 3 open reservoirs with capacities of 6, 6, and 12 million gallons. They are lined with concrete, and the water levels are above that of the surrounding ground. A heavy dose of chlorine is used when the reservoirs are filling. Considerable dust blows into them. Chlorine and copper sulphate are used to prevent microscopical growths. There is considerable trouble from bacterial aftergrowths from March to November. There is no pollution from cross-connections. The aftergrowths are attributed to the open reservoirs.

Thirteen cities with one or more open reservoirs reported no bacterial aftergrowths. In response to the question, "Do you have any evidence of increase in *B. coli* in the distribution system from sections where there is no possibility of the water coming from an open reservoir?" 5 cities replied in the affirmative. Two or 3 have noted occasional increases, but attribute them to causes other than growths in the mains.

There are 48 open reservoirs in the cities reporting bacterial increases. There is no definite information as to how many of these contributed to the bacterial increase. There is no positive evidence that such increases constitute a menace to health, yet there is no way of telling just how much was due to pollution and how much to aftergrowths. Bacterial increases, especially in *B. coli*, tend to render unreliable our main criterion for judging the safety of water. When there is the possibility of pollution, as there is for all open reservoirs, the increase in *B. coli* content should not be ignored even though there is good evidence that it is due to the *B. coli* growing on decaying microorganisms.

The *B. coli* content of the water need not be the sole standard of quality, but the same factors that are used in judging the quality of

the water entering the distribution system should apply to the water from all open reservoirs, tanks and standpipes. Sampling points should be established throughout the distribution systems so that the water from all reservoirs, tanks, etc., will be tested with a frequency that will insure a fairly good check on the quality.

The committee would urge that more study be given open reservoirs throughout the country by the various water departments with the hope of reducing the number to a minimum. Enough information is now available to throw doubt on the wisdom of using open reservoirs without continuously chlorinating the water. *B. coli* growing on microorganisms does not constitute a menace to health, but if we become accustomed to assuming that bacterial increases in the distribution system are natural growths and of no significance the occasional occurrences of real pollution will also be ignored.

JOHN R. BAYLIS, *Chairman*,  
E. SHERMAN CHASE,  
CHARLES R. COX,  
JOSEPH W. ELLMS,

C. A. EMERSON, JR.,  
HOMER V. KNOUSE,  
H. W. STREETER.

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## DISCUSSION

CHESTER COHEN

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WE are sometimes prompted to attempt to apply a varying interpretation—a different yardstick—to the bacterial results expected to be obtained from a deep and adequately protected well water supply, from a surface supply only partially treated, and from a long stored and completely treated surface water. This differentiation would, of course, complicate the problem, especially where we could not be sure of the previous condition of the mains, or their thorough sterilization prior to installation.

Our most recent experience at Laredo in dealing with a gas forming organism in the mains led us to imagine some weakness in the purification process of the turbid, highly organic, and difficult Rio Grande water. A further examination of the particular organism by Mr. Umbenhauer, indicated its particular resistance to chlorine treatment as shown in Table I.

This organism proved to be an aerobic, spore forming, rod-shaped bacillus, forming gas only after 24 hours' incubation, and producing an atypical green sheen growth on eosin methylene blue agar. In such a case we find it a little difficult to take a consistent and yet practical viewpoint. It is obvious that large chlorine

TABLE I

Chlorine Treatment	Residual Chlorine after			Chlorine Contact Period and Gas Formation in Broth			
	1 hr.	2 hr.	5 hr.	5—15—30 min.		60—90 min.	
0.5 p.p.m.	—	—	—	+	+	+	+
1.0 "	—	—	—	+	+	+	+
1.5 "	0.4	0	0	+	+	+	+
2.0 "	—	0.5	0.25	+	+	+	+
2.6 "	—	0.66	0.3	+	+	+	+
5.1 "	—	1.0	0.5	+	+	0	0

doses and long contact periods would be required to bring such a supply within the standards of the partially confirmed test.

A. F. Allen, writing from Coral Gables, advises us that although the original well supply there is usually free of *B. coli*, and although the chlorinated water at the plant was entirely free, yet occasional main samples show its presence in the completed test. These organisms are non-sporeformers and of the non-fecal type.

Much the same problem exists at Houston, although here an occasional spurious *B. coli* type occurs in the untreated well water, as well as in the distribution system. But here, too, the problem seems to be more a question of aftergrowth in the mains, either as a result of organisms passing the sterilization unit, or as a residual bacterial contamination existing in the system and remaining unaffected by the very slight or negative chlorine residual carried in the water when it reaches the far ends of the mains. An example of this condition is shown in Table II taken from the Houston analyses, where the city meter is the origin of the water supplied to wharves 11 and 12.

TABLE II

## BACTERIOLOGICAL DATA FOR MONTH OF AUGUST

	City Meter Sta. No. 23	Wharf No. 11 Sta. No. 21	Wharf No. 12 Sta. No. 22
10 c.c. tubes showing gas formation	8	12	3
10 c.c. tubes showing confirmed <i>B. coli</i>	4	7	1
No. of samples examined	16	16	17
Per cent of tubes showing gas	10.0	15.0	3.54
Per cent of tubes confirming <i>B. coli</i>	5.0	8.75	1.18

## BACTERIOLOGICAL DATA FOR EARLY SEPTEMBER

10 c.c. tubes showing gas formation	0	6	2
10 c.c. tubes showing confirmed <i>B. coli</i>	0	6	2
No. of samples examined	4	4	4
Per cent of tubes showing gas	0.0	30.0	10.0
Per cent of tubes confirming <i>B. coli</i>	0.0	30.0	10.0

From these preliminary data we see an indicated trend toward positive improvement at the city meter where water is being furnished to the wharves, but at the same time notice, not only a corresponding lack of improvement, but an actual lowering in the sanitary quality of the water supply at these two wharves.

In a way we regret the confusing results due to bacterial aftergrowths, since they very seriously tend to cast a doubt on the reliability of the *B. coli* test as a criterion for judging the sanitary quality of a water supply. The apparent multi-

plication of these doubtful organisms and their increasingly noticed occurrence in the distribution system is becoming most confusing to the average water plant operator and bacteriologist.

We find that the plant operator after a period of doubt and extra careful operation of his purification control process, becomes discouraged and somewhat disgruntled if his distribution system samples do not equal those taken direct from the plant. He usually concludes by assuming that the bacteriological test is unreliable and only a waste of time and effort.

While we cannot agree with such a conclusion, we do believe that overemphasis can be laid on the bacterial occurrence of gas forming organisms in the distribution system. We would be more inclined to lay special emphasis on the quality of the water as placed in the mains at the pumping plant. If regular and consistent samples of the treated water going into the mains indicated freedom from polluting organisms, and if no later polluting sources, such as cross-connections or open reservoirs, exist, we would ordinarily expect the supply to be satisfactory for domestic use. Where the above conditions obtained, we have never been able to demonstrate any *B. coli* organisms among the gas forming aftergrowths in the distribution system.

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## Medical Research

IT is strange how often religion, or what is alleged to be religion, is made the basis of intolerance. To pass from the sublime to the ridiculous, from the Inquisition to the present day, even a parish magazine may be used as the vehicle for anti-vivisection propaganda. In the *Parish Paper* of the Church of St. Jude-on-the-Hill (Hampstead Garden Suburb) of May 24th, 1929, the Rev. B. G. Bouchier permitted himself to ask "intelligent people" to take the opportunity of the General Election, now past, to put an end to "the waste of public money" involved in medical research. He protested there against the expenditure of 148,000 pounds during the last financial year by the Medical Research Council.

Those of us who know the admirable use to which that money is put, in promoting medical knowledge and therewith the health and happiness of the community, would wish a formal protest to be made against such propaganda in such a place. The reverend gentleman is entitled to hold whatever private opinions he chooses about the personal characters and abilities of those engaged in medical research; the use, however, of his authority and position in the national church as a means of hindering the work of an organisation which is serving mankind, at least as well as he is, is a disgrace which the authorities of that church would do well to note. It is as though the Medical Research Council were to permit an attack upon the Church of England and its priests to be launched by one of its junior workers in the pages of a Report!—From "Enemies of Knowledge," by Professor A. V. Hill, *The Quarterly Journal of the Research Defence Society*, Summer, 1929, pp. 12-13.

# Bacteriological Basis for the Effective Pasteurization of Ice Cream\*

THE demand from the public and the trade that ice cream be produced and handled as cleanly as milk has resulted in the endeavor to lift certain phases of milk control bodily over into the ice cream field without always giving consideration to the fact that ice cream is different from milk and therefore may have to be handled differently in some respects. However, in view of our great success in improving the quality of our milk supplies it behooves us to retain in our ice cream control all those items which are clearly applicable. Where a reasonable doubt exists as to such applicability, the question should be subjected to experimental tests.

Last year Dr. W. H. Price summarized<sup>1</sup> our knowledge concerning the significance of *B. coli* in ice cream. He concluded that:

Much remains to be cleared up before we can interpret the coli test properly. . . . In the case of ice cream, the colon test has limitations in determining the efficiency of pasteurization, as it has also in determining the introduction of contamination after pasteurization. . . . We find a generally accepted opinion that the tests for *Bacterium coli* in ice cream require a thorough knowledge of the previous history of the sample to enable any proper interpretation. Such tests cannot, in the present state of our knowledge, serve as a measure of manurial pollution or as a measure of the efficiency of pasteurization. Neither do they contribute to the detection of pathogens nor to the prevention of disease transmission. *Bacterium coli* determinations may indicate that the dairy product under examination has been kept under conditions favorable to the development of bacteria commonly found in milk. The same conditions are disclosed by the Standard Plate Count, and the Direct Microscopic Count, both of which have the advantage of common acceptance and application. . . .

Irwin comprehensively reported<sup>2</sup> on the present status of ice cream sanitary control and showed that the states and municipalities differ in pasteurization requirements over a range from 142° F. for 25 minutes to 185° F. flash.

Zoller,<sup>3</sup> after an extensive inquiry to 500 ice cream companies, to which he received 179 replies, reports the temperatures and holding periods range from 140° F. for 30 minutes, to 165° F. for 30 minutes and up to 185° F. for 10 minutes, with all sorts of intermediate com-

\* Report of the Committee on Dairy Products and Eggs, presented to the Food, Drugs and Nutrition Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 4, 1929.

binations of temperatures and times. Seventy firms used 145° F.; 33 used 150° F.; and 12 used 160° F. all for 30 minutes.

It is generally known that several municipalities require a pasteurization temperature of 160° F. for 30 minutes, and some as low as 140° F.

In the absence of any known experimental work to demonstrate a proper temperature and time for pasteurizing ice cream, health officers have either literally followed their milk control procedure, or have assumed that, on account of the greater content in ice cream of solids (especially fat) with its presumably protective effect, the temperature must be raised to some undetermined point. They invoked the *B. coli* count, as used and interpreted in milk control, and set the requirements to be such as they thought would kill *B. coli*.

The reasonableness of assuming a protective influence by the increased solids in ice cream and the fallacy of expecting to kill all *B. coli* as a measure of effective pasteurization have recently been experimentally elucidated.

Beavens<sup>8</sup> has just shown that the death points of certain strains of *B. coli* which had previously been found to lie between 143–144° F. for 30 minutes, actually were raised above 145° F. for 30 minutes when 4–20 per cent lactose was added to the broth. He quotes Robertson<sup>9</sup> that hypertonic solutions have a protective effect up to and including 50 per cent sucrose. He agrees with the earlier workers that "the coli test is not a true index to proper pasteurization of milk."

Since the publication of Price's review,<sup>1</sup> Tanner and Windsor,<sup>6</sup> working with milk, studied 23 strains isolated from human intestines, water and sewage, and reported:

Although neither the *Escherichia coli* (*Bacterium coli*) cultures nor the *Serratia marcescens* (*Bacillus prodigiosus*) strains used proved to be very good as indicators of efficiency of pasteurization by the holder process, for several reasons the *Escherichia coli* (*Bacterium coli*) would probably prove to be more accurate as such an indicator. It seems fair to assume . . . that *Escherichia coli*, in concentrations in which it occurs in milk, would be destroyed by exposure to 62.8° C. for 30 minutes, yet there is always the possibility of encountering resistant strains or cultures containing some resistant cells.

They thus align themselves with the preponderance of authoritative opinion that the coli destruction is not always a reliable measure of the effectiveness of milk pasteurization. Since hypertonic solutions exert a protective effect, then the coli count in ice cream, used as in milk control, is all the more unreliable.

As a matter of fact, we are not interested in the destruction of the coli organisms as such, but only as they may be easily demonstrable and possibly significant companions of pathogenic organisms which



are not easily demonstrable. If it were shown that pasteurization of commercial ice cream at 145° F. for 30 minutes is ample to kill all pathogenic organisms, then the usefulness of the coli determination would become clearly of little consequence. This information has just now been supplied.

Oldenbusch, Frobisher and Shrader<sup>7</sup> inoculated cream with two strains of *B. typhosus* recently isolated from cases; two strains of beta type hemolytic streptococci, one from scarlet fever, the other from septic sore throat; and a culture of tubercle bacilli of the bovine type. All of the organisms were killed in less than 7 minutes at 142° F. and in less than 3 minutes at 145° F.

They conducted similar experiments on a commercial ice cream mix, and found that *B. diphtheriae* did not survive heating for ½ minute at 145° F.; *B. typhosus* and the streptococcus were killed in less than 5 minutes; and the tubercle bacillus in 6 minutes at 145° F., and 3 minutes at 150° F.

In comparing these two sets of experiments, a slightly greater resistance was encountered in the case of the ice cream mix as compared with the cream.

Inasmuch as the number of pathogenic organisms involved was much greater than would obtain under natural conditions of contamination, they conclude that the time and temperature of 30 minutes at 143.5° F. recommended by the Committee on Dairy Products and Eggs of the American Public Health Association for the pasteurization of milk allows an ample margin of safety for the pasteurization of cream and of commercial ice cream mix.

From all of this work it follows that the *B. coli* is no more useful in determining the proper pasteurization procedure for ice cream mix than for milk. Direct work with pathogenic organisms certainly shows that a temperature of 145° F. for 30 minutes is a proper procedure for ice cream mix pasteurization.

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# Study of the Effects of 736 Tonsillec- tomies and of 741 Controls\*

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IT is impossible to think of any operation or procedure which is as commonly resorted to for the correction of any and all defects or complaints as is a tonsillectomy. Our search through available literature on the subject reveals an abundance of material and an almost universal opinion that good results, both curative and preventive, are to be expected.

Kaiser, of Rochester, N. Y., has done a very thorough and gratifying piece of work with convincing conclusions.

Besides verifying the figures and results obtained by Kaiser, Barrett, Robey, Mann and others, we have drawn some conclusions as to:

1. The age group which shows the greatest improvements and the complaints, if any, which can be relieved to the greatest degree in the respective age groups.
2. The length of time after operation before improvement is evidenced and the symptoms showing the earliest tendency toward improvement.
3. The effect on the school progress of those being physically handicapped.
4. The effect on children with subnormal mentality or those who are mentally retarded and lack application and alertness.
5. The effect of tonsillectomies on the progress of children having coexisting conditions related and not related to diseased tonsils.

It has been suggested by Brokay and others that the parents should be consulted as to the child's condition following the operation. In our study the parents' opinions were obtained in each case. We believe that information secured through the parents' daily observation is likely to be more dependable than that which might be secured from any other single source; however, the teachers' observations were not overlooked. We were also mindful of the fact that this information should be supplemented by physical examinations before and after operation.

This study was based on cases operated on by private physicians

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\* Read before the American Child Health Association and the Child Hygiene Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., September 30, 1929.

in the Oakland County Tonsil and Adenoid Clinics together with a small number of cases operated on in other clinics.

Oakland County's tonsil and adenoid clinic was organized because of the difficulty and expense of caring for indigent children in state institutions, and because of the lack of outpatient departments in our city and county hospitals. Each case, before admission to the clinic, was first recommended by the family physician both from the medical and financial standpoint, then carefully investigated by our field workers and by the Township Supervisor. Indigent patients and those who were able to pay up to \$10.00 were admitted. The tonsillectomies were performed by local surgeons at greatly reduced fees, and we gratefully acknowledge the support given the clinic by the Oakland County Medical Society.

A careful history was taken and a physical examination made on each child upon admittance, and through this arrangement 736 cases were operated on and studied.

In determining the candidates for the clinic and for follow-up work, uniform blanks were used.

It was determined early in the study to check carefully the improvement rather than the complete cessation of complaints or symptoms. Although in many cases the symptoms or complaints were entirely absent after the operation, it seemed reasonable that our study be confined solely to improvements.

A study was made of the effects of tonsillectomies upon children who were not gaining weight and not developing normally, those with evidence of malnutrition, those with marked enlargement of cervical glands, those with rheumatic manifestations, those who complained of colds and sore throats, and those with retarded school progress and subnormal mentality.

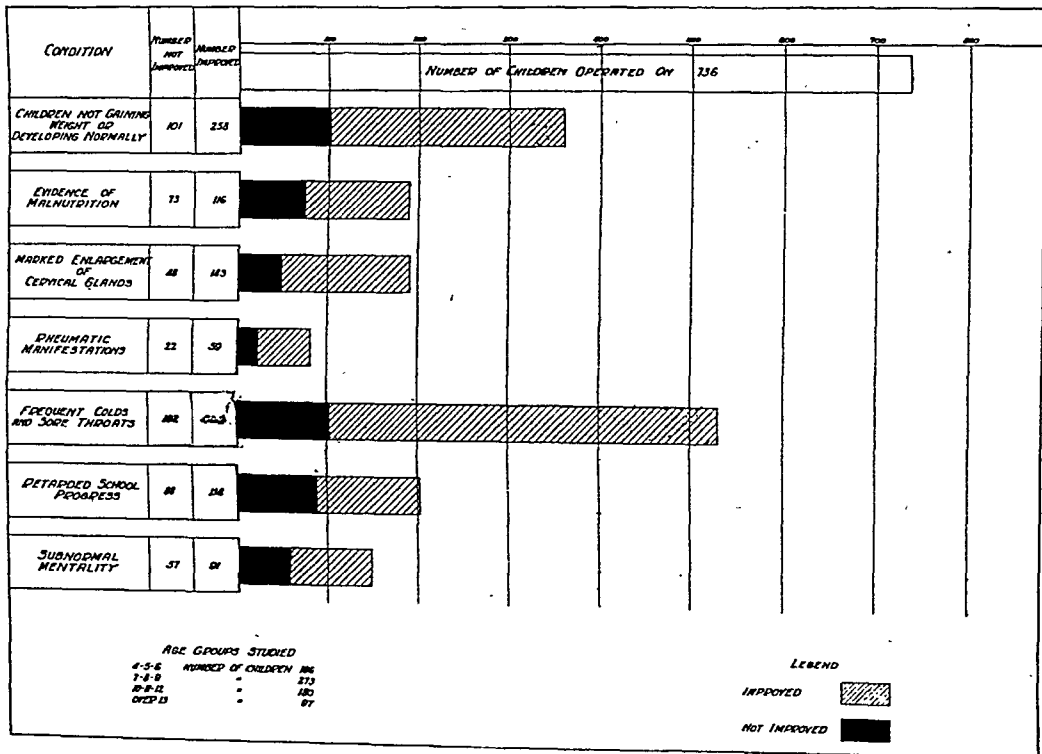
In Figure I, we have a general summary of cases studied before and after operation. There was apparently no complaint or symptom which failed to improve. In our study of cervical glands, only cases which showed marked enlargement were considered, and out of 191 cases studied, 48 children failed to show improvement. The most striking improvement occurred in the group having frequent colds and sore throats. Of the total number studied, 530 cases, or 72 per cent, had this complaint before the operation, with 102 failing to show any improvement.

The enthusiasm of the mothers in regard to the children's progress in school following the operation was very marked. Of the 222 children having this complaint only 88 failed to show improvement.

We were somewhat surprised to note the effect of this operation on the group of subnormal mentality. Out of 148 cases in this group 57

FIGURE I

## STATUS OF COMPLAINTS BEFORE AND AFTER OPERATION



failed to show improvement. There was a marked improvement in cases with evidence of malnutrition. One hundred eighty-eight, or 25.5 per cent of all cases studied, showed this complaint, and there was a failure of improvement in only 73 of this group. The same beneficial results were noted in children not gaining weight or not developing normally, and in those having rheumatic manifestations.

## STUDY BY AGE GROUPS

In studying the beneficial effects on children grouped according to age (see Figure II), no striking results were obtained. The most marked improvement of all complaints was observed in the younger age groups.

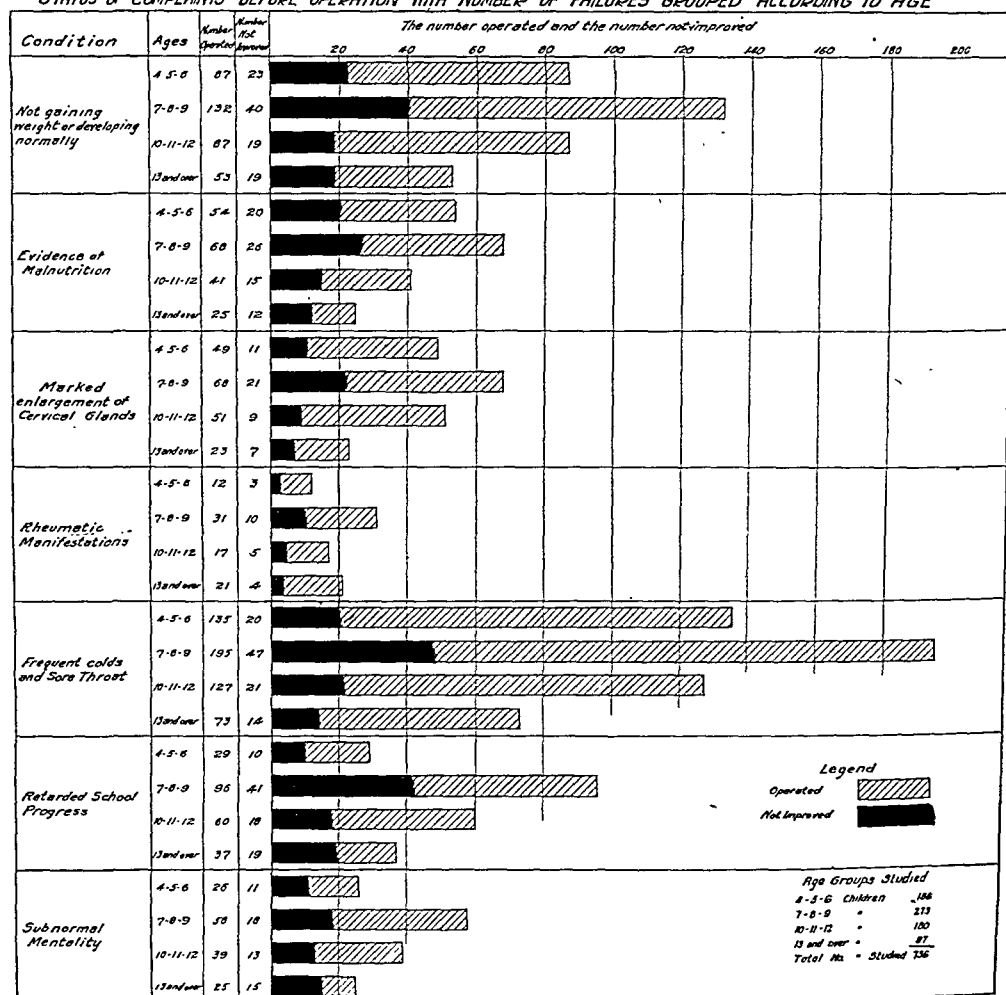
Failure in older age groups (13 and over) can be accounted for in many ways. The longer any ailment persisted the less marked the improvement; it was only natural for the older age group to be less responsive to improvement in school progress and mental efficiency than children in the younger age groups.

## STUDY OF RESULTS BY TIME LAPSING SINCE OPERATION

In this study we have drawn some conclusions as to how soon after operation improvement may be expected. From the figures

FIGURE II

STATUS OF COMPLAINTS BEFORE OPERATION WITH NUMBER OF FAILURES GROUPED ACCORDING TO AGE

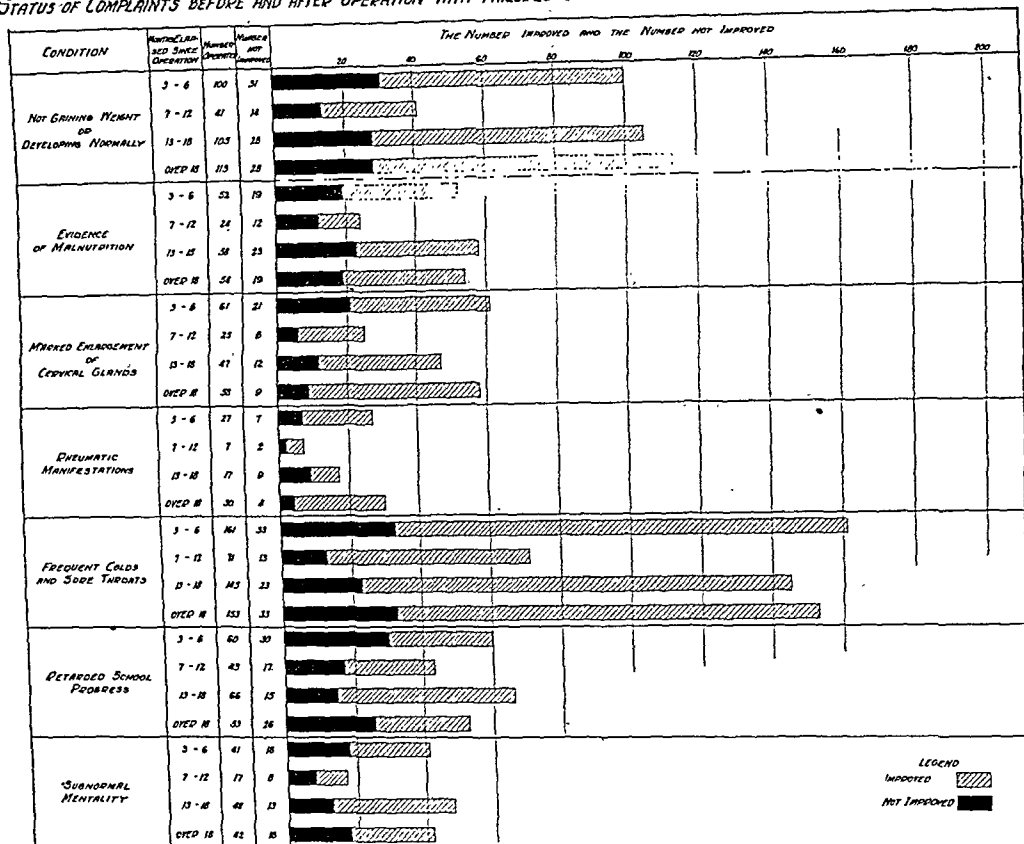


shown in Figure III, children who were not gaining weight and were not developing normally before the operation showed a little improvement during the earlier months, reaching the peak of improvement about 16 to 18 months after operation. There were no marked beneficial results in children showing signs of malnutrition, although a failure of only 36.5 per cent during the first 6 months was gratifying.

As was expected, improvement in the marked enlargement of cervical glands was not characteristic to any period. Rheumatic manifestations showed remarkable improvement during the first 6 months. Frequent colds and sore throats were decidedly improved during the first 6 months following operation. Advancement in school progress and mental development was not marked during the first 6 months after operation but there seemed to be consistent progress in the periods which followed.

FIGURE III

STATUS OF COMPLAINTS BEFORE AND AFTER OPERATION WITH FAILURES GROUPED ACCORDING TO TIME ELAPSED SINCE OPERATION



We have not tabulated the relief from mouth breathing as the study has been done many times by others with most convincing results.

General progress of those cases showing improvement in one or more complaints was very noticeable, the most outstanding results being obtained during the first 6 months. Out of 192 cases in this age group, there were 12 failures (6 $\frac{3}{10}$  per cent), or 93.7 per cent of the cases showed complete or partial improvement.

#### STUDY OF RESULTS IN PRESENCE OF COEXISTING CONDITIONS

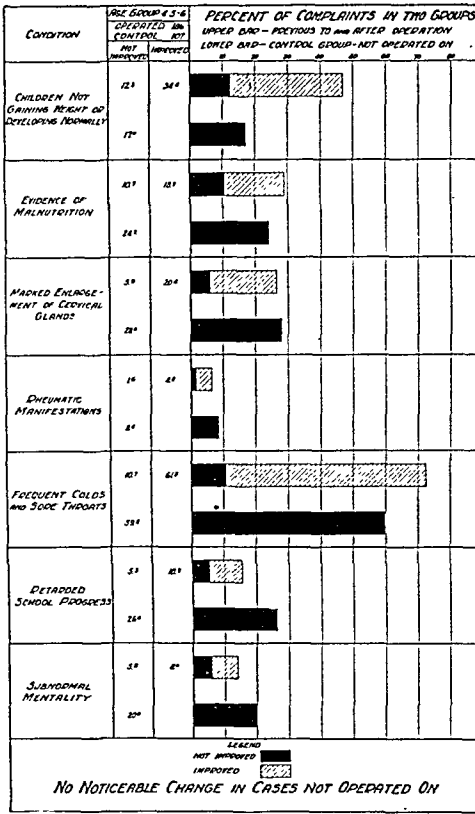
We have analyzed the results of tonsillectomies on children who at the time of operation had some coexisting ailment.

From the group of 736 children who were operated on, 120 had coexisting conditions. In the analysis of the results of operation on this group (see Table I), we found that 43 failed to improve, and 77 showed improvement.

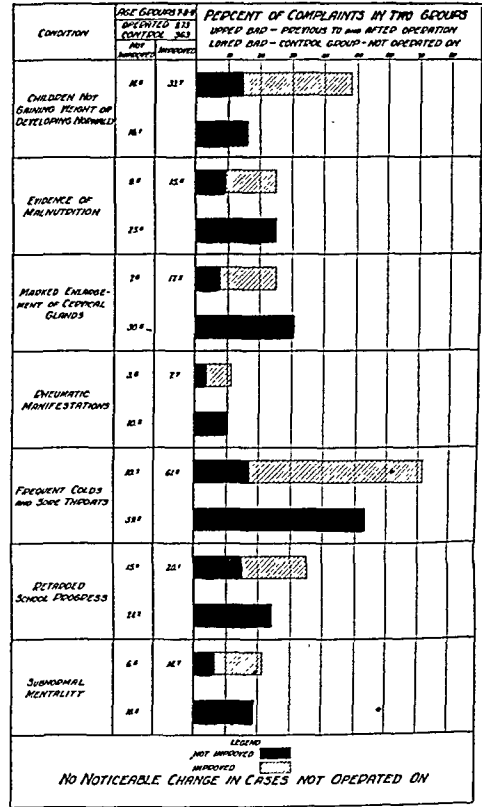
We have failed to find that coexisting ailments had any influence upon the results of the operation with the possible exception of pulmonary tuberculosis.

From the table it will be seen that in this group there were 26

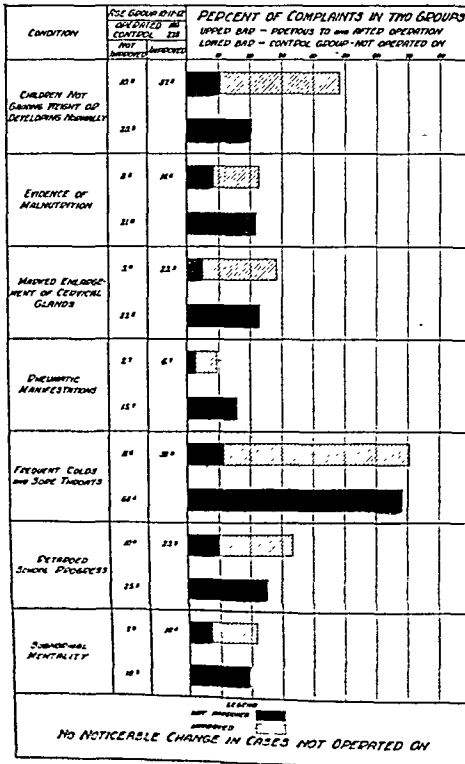
FIGURE IV



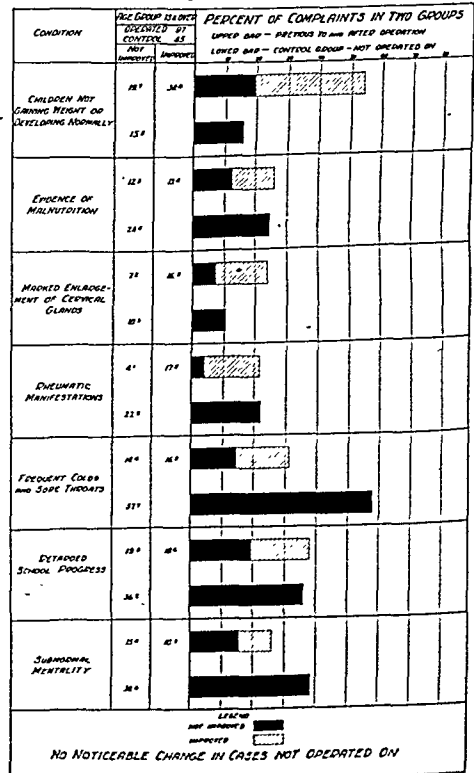
A



B



C



D

cases of pulmonary tuberculosis, 16 of which failed to improve. Considering that the number of cases failing to show improvement is almost twice as great as the number showing improvement, the ratio of failure to improvement would be 2 to 1. The figures, of course, are too small to do more than bear out the consensus of opinion that great care should be exercised before determining whether or not the child with pulmonary tuberculosis should be operated on.

TABLE I

ANALYSIS OF RESULTS OF OPERATED CASES IN WHICH COEXISTING  
AILMENTS WERE PRESENT AT TIME OF OPERATION

Total Number of Cases 120

Conditions Present	Total Number of Children	Number Failed to Improve	Number Showed Improvement
Pulmonary Tuberculosis	26	16	10
Heart	7	1	6
Ear	16	5	11
Chorea	5	2	3
Dental (marked defects)	20	7	13
Infectious Diseases following within 10 days	5	3	2
Sinus	13	5	8
Hay Fever—Asthma	2	1	1
Kidney	7	2	5
Nervousness	9	0	9
Surgical	8	1	7
Gynecological	2	0	2
Total	120	43	77

This table, with the one exception mentioned, shows us that co-existing conditions are not contraindications for operation. As a matter of fact they might even be additional reasons for operation.

#### STUDY OF CONTROL GROUPS

In our control group (see Figure IV), we have examined 741 children whose state of health was apparently similar to that of those in the group operated on.

The general progress made by the children in the control group was, as would be expected, unsatisfactory. Children with infected tonsils retained the focuses of infection and the symptoms and complaints which were present at the time of the first examination were still apparent at the check-up made a year later.

Careful analysis of Figures V—A, B, C, and D, leads us to assume that the theory of waiting for the child to outgrow its defects is not justifiable.

#### SUMMARY AND CONCLUSIONS

From an analysis of the complaints of 736 children before and after operation, compared with an analysis of the complaints of 741



children in the control group having similar complaints on examination and reexamination one year later, the following conclusions were made:

1. Tonsillectomy offers a child considerable relief from such common complaints as sore throat, head colds and mouth breathing. It reduces malnutrition and promotes disappearance of enlarged cervical glands.
2. Complaints have been relieved in 91 per cent of our group of cases operated on. We should not be unmindful of the fact that tonsillectomy is a surgical procedure and has its possible dangers and complications. However, in the group of cases operated on in our County Tonsil Clinic no fatalities have occurred.
3. Comparison of the results obtained from a study of the different age groups clearly indicates that in order to obtain the maximum benefit the child should be operated on in early childhood.
4. Children with subnormal mentality and retarded school progress due to enlarged tonsils and adenoids showed improvement in 40 per cent of all cases operated on.
5. In our series of 736 cases, coexisting conditions were present in 120 cases. The conditions should not be considered as contraindications for tonsillectomy, with the exception of cases of pulmonary tuberculosis which must be very carefully studied before operation is decided upon.
6. Complaints in the control group of cases do not show any improvement during the period of one year of observation as compared with 91 per cent of improvement shown in the group of cases operated on.

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# The Minimal "Chlorine Death Points" of Bacteria\*

## II. Vegetative Forms III. Spore-Bearing Organisms

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THE results of continued tests on vegetative forms and on the common spore-bearing bacteria are presented in this paper, with a more detailed description of the technic employed.

### TECHNIC

*Preparation of the Chlorine Solutions*—Double distilled water in a pyrex or Jena flask was saturated with chlorine gas from a tank of liquid chlorine made by electrolysis for the treatment of water supplies.† From this, five stock solutions were made, containing 10, 50, 100, 200 and 500 p.p.m. These were stored in brown glass stoppered bottles in an icebox and restandardized every 2 weeks.

From the stock solutions the experimental dosage solutions were prepared with double distilled and sterilized water in 250 c.c. pyrex or Jena flasks. The initial quantity of water in each flask was 150 c.c. Fifty c.c. were removed for the chlorine absorption test of the glassware and water. The remaining 100 c.c. portions of the dosage solutions were used in duplicate for exposure of the bacteria under test. One flask was tested bacteriologically and the other used for determination of the residual chlorine. Usually there was no material difference between the dose of chlorine introduced and the residual amount found, and the latter was, therefore, the amount recorded for the bactericidal experiment.

The chlorine absorbing properties of the water and glassware were determined just before the test proper by treating 50 c.c. of the water in each flask for 5 minutes with 0.3 c.c. of a stock solution of chlorine containing 60 p.p.m. After 5 minutes,  $\frac{1}{2}$  c.c. of orthotolidin solution was added and the resulting color compared with standards. The water treated as above received 0.36 p.p.m. of chlorine. The amount

\* This paper supplements an earlier report on the subject.<sup>2</sup>

† Obtained from Wallace and Tiernan, Newark, N. J.

of chlorine absorbed was usually negligible. If there was material absorption of chlorine by the water and glassware, the set was discarded. In no case were flasks giving a final content of less than 0.25 p.p.m. used in the experimental work.

The glassware was first carefully cleaned with sulphuric acid + potassium dichromate, and then rinsed several times with distilled water. The Nessler tubes used for the chlorine determination by the orthotolidin method were of uniform shade and selected carefully to give equal depth of solution. After each experiment they were rinsed thoroughly, filled with distilled water, and allowed to stand in this condition until again needed. Some lots of glassware were found to absorb appreciable amounts of chlorine and these were eliminated.

*Method of Chlorine Determination*—For the more concentrated solutions (above 5 p.p.m.), the iodine thiosulphate method was used as follows:

Twenty-five to 100 c.c. of the sample were diluted if necessary to 100 c.c. with the tested double distilled water, and to this solution 5 c.c. of potassium iodide (150 gm. per liter) and 1 c.c. of a solution of equal parts glacial acetic acid and water were added. The mixture was allowed to stand in a dark place for 10 minutes. It was then titrated with N/40 sodium thiosulphate to a straw-yellow color, when 1 c.c. of starch reagent was added and the titration finished.

For solutions containing less than 5 p.p.m. the orthotolidin method<sup>2</sup> was used. The color standards were made from copper-sulphate and potassium dichromate solutions.

*Procedure of Bacterial Exposure*—The technic of determining the "chlorine death points" of the organisms was essentially the same as that given in the previous report.<sup>1</sup> Nutrient agar plates were used for growing most of the strains, but special mediums were employed when necessary to secure growths. The Gram-negative cocci here included were grown on the modified Torrey's medium described by White and Pope<sup>3</sup> for cultivation of the meningococcus.

The tests were carried out by adding approximately 100 to 300 organisms per c.c. to the contents of each of two flasks containing 100 c.c. of double distilled water which had just been tested for chlorine absorption. From one flask, 1 c.c. was planted to determine the number of organisms present, then a definite amount of free chlorine was added to each. One was tested for residual chlorine immediately after the experiment; the other flask was used for determining the rate of destruction of the organisms and the time required to kill. To do this 1 c.c. of the contents was plated at intervals of 10, 15, 30, 45 and 60 seconds. The plates were poured immediately, incubated for

48 hours at 37° C., the organisms counted, and the rate of destruction and time required to kill noted. It was found that 48-hour incubation was usually necessary, because in some instances colonies appeared after 48 hours on plates which in 24 hours had no visible growth.

## RESULTS

## II. VEGETATIVE FORMS

A brief summary of the previous work on vegetative cells is here included.<sup>1</sup> Two hundred and thirty-five strains, comprising 23 species, were tested. A large percentage of these strains were killed by 0.1 p.p.m. of free chlorine, in 15–30 seconds. None survived 25 p.p.m. *B. coli* stood out as in general the most resistant, and was deemed most suitable for use as an "index organism" of effective disinfection of vegetative cells by chlorination.

We have since chlorinated 126 additional strains including 8 new species, the results of which are summarized in Table I.

TABLE I

DOSAGE OF FREE CHLORINE REQUIRED TO KILL VEGETATIVE  
CELLS OF BACTERIA IN 15–30 SECONDS

Chlorine p.p.m.	Species	No. of Strains	Chlorine p.p.m.	Species	No. of Strains
0.10	<i>B. aërogenes</i>	28	0.15	<i>B. aërogenes</i>	9
	<i>B. fecalis alkaligenes</i>	5		<i>B. coli</i>	5
	Gonococci	7		Meningococcus	1
	<i>M. catarrhalis</i>	3	0.20	Non-lactose fermenting bacteria from water	14
	Meningococci	25		<i>B. aërogenes</i>	4
	<i>B. mucosus capsulatus</i>	4		Non-lactose fermenting bacteria from water	3
	Non-lactose fermenting bacteria from water	18			
	<i>V. cholerae</i>	3	Total strains		126

Most of the vegetative strains, regardless of species, were killed by 0.1 p.p.m. of free chlorine. A few survived 0.15 p.p.m., and none required more than 0.20 p.p.m. for their complete destruction. Three hundred and sixty-one vegetative strains\* have been tested, representing 32 species and including the more common pathogens. The later findings support our earlier conclusion that *B. coli* is probably the organism best suited for use as a criterion of effective chlorination of water supplies, swimming pools, dairy equipment, dishes and other utensils.

\* Including previous work.<sup>2</sup>

## SPORE-BEARING ORGANISMS

One hundred and forty-two strains of 17 species of spore-bearing organisms were studied. These, which included the more important pathogens and non-pathogens of both aërobic and anaërobic types, are shown in Table II.

The anaërobes were all grown in liquid beef heart medium except *Cl. botulinum A.*, *Cl. botulinum B.*, *Cl. sporogenes* and *Cl. welchii*, which were plated in the sulphite-glucose-iron agar of Wilson and Blair.<sup>4</sup>

*B. aërosporus* was grown on lactose agar. The other aërobes were grown on plain agar.

TABLE II

DOSAGE OF FREE CHLORINE REQUIRED TO KILL  
SPORES OF BACTERIA IN 15-30 SECONDS

## 1. Anaërobes

Chlorine p.p.m.	Species	No. of Strains	Chlorine p.p.m.	Species	No. of Strains
1.0-2.5	<i>Cl. welchii</i>	25	25.0	<i>Cl. botulinum</i>	2
15	<i>Cl. tetani</i>	1		<i>Cl. tetani</i>	1
	<i>Cl. botulinum A.</i>	1		<i>Cl. chauvei</i>	1
	<i>Cl. chauvei</i>	1	30.0	<i>Cl. sporogenes</i>	1
	<i>Cl. sporogenes</i>	1	35.0	<i>Cl. chauvei</i>	1
17.5	<i>Cl. sporogenes</i>	18		<i>Cl. oedematiens</i>	1
	<i>Cl. botulinum B.</i>	4	40.0	<i>Cl. tetani</i>	1
18.0	<i>V. septique</i>	1			—
20.0	<i>Cl. sporogenes</i>	1			61

## 2. Aërobes

Chlorine p.p.m.	Species	No. of Strains	Chlorine p.p.m.	Species	No. of Strains
18	<i>B. aërosporus</i>	28		<i>B. cereus</i>	2
45-65	<i>B. anthracis</i>	6	160	<i>B. subtilis</i>	4
66-85	<i>B. anthracis</i>	21	190	Unidentified spore bearers from sewage	6
	<i>B. megatherium</i>	4		<i>B. vulgatus</i>	1
86-100	<i>B. anthracis</i>	5	280		—
	<i>B. mesentericus</i>	1			81
135-150	<i>B. mesentericus</i>	1			
	<i>B. brevis</i>	2			

There was wide variation in the amount of chlorine required to kill various species of spore-forming bacteria. For complete destruction, the anaërobes required a range of concentrations from 1.00 p.p.m. for the least resistant, *Cl. welchii*, to 40 p.p.m. for a strain of *Cl. tetani*. The aërobes required a higher and wider range of chlorine concentrations, varying from 18 p.p.m. for *B. aërosporus* to 280 p.p.m. for a strain of *B. vulgatus*.

## DISCUSSION

These results demonstrate the futility of attempting to kill spore-bearing bacteria by use of chlorine in waterworks practice or in other phases of practical disinfection. The many times larger dosage of chlorine required to kill spores as compared to vegetative cells (10 to 1,100 times) would render the cost prohibitive, and cause a highly objectionable taste and odor in water supplies. Moreover, such excessive dosage seems unnecessary, since the essential purpose of the disinfection is the destruction of certain common pathogens of intestinal or respiratory origin, which belong to the group of vegetative forms, of which *B. coli* is the generally accepted group representative.

Should it be desirable under special circumstances to rely on the destruction of a member of the spore-bearing group as evidence of disinfection of spores, probably *B. subtilis* would be most suitable and safest to use. Its chlorine "death point" of 160 p.p.m. is higher than that of the common pathogens of the spore-bearing group and about 600 to 700 times that of *B. coli*.

In the light of the above findings, discretion should be used in adjusting the dosage of chlorine in water supplies on the basis of the gas tests, when lactose fermenting spore bearers are present. These organisms, which are widely prevalent in nature, require for their destruction amounts of chlorine ranging from 2.5 p.p.m. for *Cl. welchii* to 18 p.p.m. for *B. aërosporus*, or from 10 to 70 times that required by *B. coli*. *B. aërosporus* is so resistant to chlorine that its destruction in a water supply by chlorination cannot reasonably be expected.

Probably a residual chlorine dosage of 0.25 p.p.m., equivalent to the chlorine "death point" of *B. coli*, would be a safe margin to carry in water supplies under ordinary circumstances. In other words, the principle seems sound to require as a margin of safety, an excess of chlorine equivalent to the minimal "chlorine death point" of *B. coli*, after the primary chlorine demand of the water is satisfied. The same principle seems applicable to swimming pools; i.e., that 0.25 p.p.m. of residual chlorine would be a safe margin. This amount, if consistently maintained, should give assurance of the destruction of the common pathogenic bacteria here studied, which might reasonably be expected to find their way into water unless the conditions are very exceptional.

## SUMMARY

In this and a preceding investigation, the "chlorine death points" or minimal amounts of free chlorine required to kill in 15–30 seconds were determined for 503 strains of 48 species of bacteria. The experimental conditions were adjusted to exclude as nearly as possible chlo-

rine absorbing factors other than the organisms, so that the relative resistance of the organisms to free chlorine would be indicated.

From the standpoint of resistance to chlorine, the bacteria studied fall into two major groups, (1) vegetative cells, and (2) the spore-bearing organisms. The vegetative group, including the common pathogens of both intestinal and respiratory origin (exclusive of the tubercle bacillus), were killed by small doses of free chlorine, i.e., 0.15 to 0.25 p.p.m. in 15 to 30 seconds. *B. coli* was found to be in general somewhat more resistant to chlorine than the other vegetative forms and was considered to be a suitable "index organism" for use as a criterion of effective disinfection by chlorine.

The spore-bearing group was found to be from 10 to 1,100 times more resistant to chlorine than the vegetative forms. The "chlorine death points" of spores ranged from 2.5 p.p.m. for *Cl. welchii* to 280 p.p.m. for *B. vulgatus*. *B. subtilis*, with a "chlorine death point" of 160 p.p.m., was considered to be probably best adapted and safest for use as an "index organism" of the spore-bearing group.

The wide divergence, however, in the resistance of spores on the one hand, and of vegetative cells on the other, suggests that in practical disinfection by chlorine, the attempt to secure consistent elimination of spore-bearers is futile, and serves to emphasize the primary purpose of such disinfection, which is, generally speaking, to safeguard against a relatively few pathogens of intestinal and respiratory origin belonging to the vegetative group. Considering these primary objects, the regular and consistent destruction of *B. coli* appears to afford a more suitable practical criterion of effective chlorine disinfection, than would a spore-bearing "index organism" such as *B. subtilis* or a total bacterial count which would be unduly affected by excessively resistant spore-bearing organisms of little sanitary significance.

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## Health Records of School Children in France

THE educational authorities of the city of Paris have decided to introduce into the public schools a system of individual health records which will permit regular supervision over the physical development and health of the children. The health records will be introduced in the elementary schools.—*Paris Méd.*, Feb. 1, 1930, p. XXV.

# The Sanitary Aspects of Refuse Collection and Disposal\*

FOUL odors are not now believed, as they once were, to be a direct cause of disease, but there is a growing appreciation of the fact that they indicate the presence of filth, and that filth is concomitant with a high incidence of disease and mortality. Civilized communities are therefore demanding greater freedom from what are generally termed "nuisances" in their various forms, offensive to sight or smell.

The sanitary aspects of the several steps involved in the handling of municipal refuse are here discussed:

## I. HOUSE PREPARATION

The separation of garbage, combustible refuse, glass, metals and ashes depends upon the method of disposal. Separation at the source should conform to the method of collection. In exceptional cases, where separation at the source is impracticable, this may become a factor affecting the method of disposal.

*Garbage*—Garbage should be drained before putting it in the receptacle from which it is collected. Where local conditions indicate an advantage in wrapping the garbage in paper after draining and before putting it in the collection receptacle, this may be done. It should only be made compulsory after a study of local conditions and taking into account the method of final disposal to be employed. Garbage should not be wrapped if it is to be treated by the reduction process; nor if it is to be fed to hogs, since it will produce a very unsightly litter and add to the residue for final disposal at the feeding grounds. On the other hand there is a certain advantage if the garbage is to be incinerated and greater ease in keeping the cans clean.

Practically, whatever advantage there may be in wrapping garbage may be obtained by using a small garbage container supported on a swinging arm beneath the kitchen sink. This has an inner receptacle with a perforated bottom which does not reach to the bottom of the outer and water-tight container. If the garbage is properly handled before and while being placed in the inner container, very little moisture will go through. Whatever does may be emptied in the kitchen sink. The house container should be emptied in the outside collector-can and washed at least once a day.

Another simple type of container that has been found generally satisfactory for draining garbage is a small enamelware vessel with perforated sides and bottom, about 3" deep, in the shape of a quarter section of a circle so that it may be placed in one corner of a sink. It is usually provided with three short legs about 1½" long.

For multi-family houses with janitor service for removing the garbage of each

\* Report of Committee on Refuse Collection and Disposal, presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 1, 1929.



family to the outside collector—can the foregoing rules and comments may need modification to meet local conditions.

Receptacles for holding garbage at houses and other buildings before it is taken away by the collector should be of metal, with metal covers, watertight and flyproof. They should be placed at some point readily accessible to the collectors, who should preferably come to the house for the garbage can instead of requiring the householder to take the can to the street.

The collection can should be kept covered, to exclude flies and other vermin, and rain water, and should be so placed that it will not be tipped over by dogs or other animals.

In some cases an ordinance requiring covered and water-tight cans has been difficult to enforce. In such cases the city may provide the cans, the cost of which should be considered as part of the cost of collection and not charged against the householder, as he might then be deterred from accepting the service of removal. The can, replaced by a clean one, is taken to the point of disposal or to a transfer station, where it is washed with hot water and disinfected if necessary.

If the contents of the collection can are kept dry by draining at the kitchen sink and by excluding rain water, the danger of offensive odor is reduced. If odors do occur, they can be remedied by the householder by occasional washing or other cleaning of the cans, and if necessary, the use of a deodorant and, on the part of the city, by prompt removal.

*Ashes*—Metal cans, of a size appropriate for the collection service, should be used as house receptacles for ashes. Economy to the householder and efficiency in the collection service demand that the cans be strong. No garbage or other decomposable organic matter or waste paper should be placed in the ash cans. Waste glass may be permitted in some cases.

*Tins, Cans, Metal, Glass, Paper and other Combustible Refuse*—Preferably these materials, if not too bulky, should be placed in strong metal receptacles, or else—except glass or sharp metals—in stout canvas bags. Large metal refuse, boxes and cartons may be collected without placing in receptacles. If disposed of by incineration, heavy metals and glass should be excluded.

*Single Mixed Collection System*—Where garbage, mixed with ashes, glass, cans, paper and miscellaneous wastes generally are collected together, the house treatment will be similar to that for garbage. Where garbage is not included the house treatment will conform to the treatment for ashes.

On collection days the householder should put the containers out at some place readily accessible for the collectors. The exact place may vary with local conditions, single or multiple family dwellings, size of lot, position of house on lot, accessibility of rear yard, if any, presence or absence of alleys, but in general the preferable plan is to set the containers as near as may be to the street or alley entrance to the rear or side yard, leaving to the collectors the emptying or removal of the container and its return to the house.

## II. TRANSPORTATION

The collection of municipal refuse and the method of disposal are closely connected and should be considered as a single problem. In some cases all classes of refuse are collected combined; in others they are collected and disposed of separately; and in still others they are collected and disposed of in part separate and in part mixed. In cases where part of the refuse is disposed of by incineration, the garbage and inflammable refuse may be mixed.

The collection of house refuse may be also classified as municipal, contract, and private. In municipal collection the refuse is collected by teams or trucks and employees of the municipality. In contract collection the refuse is collected by the employees and equipment of a private firm under contract. In some cases the refuse is collected by private individuals who are usually licensed by the municipality. There are also instances where the refuse is collected by the municipality and disposed of by contract and *vice versa*. It has been found that the sanitary features have sometimes been neglected under private and contract collection and disposal of refuse and that nuisances are often created, but this is not necessarily so with a properly prepared contract and specifications and strict supervision over the work.

The wagons or trucks in which the garbage is collected should be provided with smooth, water-tight metal bodies to prevent dripping or with metal barrels or containers. Wooden bodies or barrels should not be used as they absorb moisture from the garbage and soon become foul smelling and insanitary. For convenience in loading they should be hung as low as practicable. The metal bodies or barrels should be washed and disinfected daily and kept in good repair. While making collections, the wagon or receptacles should be covered to prevent spilling and the spread of odor. The service should be reliable and capable of expansion so that collections need not be delayed. It is advantageous to have the transport of the collected material as rapid as consistent with safety, as it reduces the time the loaded vehicles are on the street. In this respect truck transport is the best and horse-drawn transport the worst. The routing should be worked out so as to cause the least nuisance.

### III. DUMPING ON LAND AND BURYING

Dumping on land is the simplest and most convenient method of disposal, but it is the method that most frequently results in a nuisance, and should therefore be carried out with great care and discrimination and under municipal control.

Ashes, including metals, glass and crockery, and containing not over 2 per cent of organic matter, may be profitably used in filling in low land or disposed of in dumps if remote from habitations and main lines of travel, where the dust may prove objectionable. Paper, boxes, etc., should be rigidly excluded, for they present an unsightly appearance and contain sufficient organic matter to invite the breeding of flies and the propagation of vermin, permit the dissemination of disease germs and, by burning, create far-reaching, pungent and offensive odors that under favorable conditions have been observed at a distance of 6 miles or more. This is a most prevalent source of nuisance in the outskirts of cities and one that calls for energetic measures for control.

Where other means of disposal are not provided, dumps of mixed refuse should be made, where the depth of fill exceeds 8' or 10', in layers not over 6' in depth. The garbage should preferably be deposited at the bottom, covered with rubbish and finally with ashes. Unless soil or other suitable material is available a sufficient amount of ashes should be allowed to accumulate during the winter to serve for this purpose during the summer months, when the proportion of ashes is small as compared with the garbage. The exposed fresh material at the face of the dump should be covered with at least 4" of soil or clean ashes at the end of each day during warm weather. Where necessary a temporary fence should be provided or other arrangements made to intercept papers that would otherwise be scattered by the wind. If active or smouldering fires occur, these should be im-

mediately extinguished, for which, in the case of extensive dumps, an ample and properly distributed supply of water should be provided. After getting headway such fires are very difficult to put out.

Refuse dumps should be in remote locations. They should not be made along the banks of streams, as is quite customary, for, aside from esthetic reasons, the impurities leaching or washing off into the water during storms add to its pollution and consequent injury for purposes of water supply, fish culture and recreation.\*

Burying in trenches is generally limited to garbage. As the area required is large and as considerable labor is involved it is not practiced extensively. Otherwise it has been found generally satisfactory in small communities, especially where the soil is loose and sandy. Since decomposition is dependent upon the aerobic soil bacteria the garbage should not be buried so deep that the air cannot readily reach it. It is also important that it should not be buried below ground water level, in which case decomposition would be greatly retarded. To prevent putrefactive odor and the propagation of flies garbage should be kept as dry as possible. To prevent dissemination of germs by the wind it should not be dry if exposed. Exposure to the weather is, therefore, in any case objectionable.

The trench is usually about 3' wide and 12" deep. The garbage is spread in 6" layers and immediately covered with 6" of earth. For winter use 10' or 15' of trench should be prepared in advance for each ton of garbage expected. Care should be taken in providing ample cover to prevent dogs, rats, etc., from getting at the garbage and scattering it about.

Disposal by burying in trenches is more sanitary and less liable to create a nuisance than dumping, while utilizing the fertilizing value of the garbage. When this method is employed for garbage the rubbish may be incinerated or used with ashes as fill, in which case all boxes and cartons should first be broken up.

#### IV. DUMPING AT SEA

The dumping of garbage at sea is carried out by some 6 or 8 English cities, by Victoria, B. C., and in this country by Oakland, Calif., Newport, R. I., and in part by New York. It is often the cheapest method for seaport towns favorably situated, but open to the objection that landward winds bring much of the floating material to shore, even from long distances, where it litters the beaches and injures them for bathing and other recreational purposes. For this reason this method was abandoned by the City of Seattle in 1904, whose garbage was dumped in Puget Sound; and in New York incineration is being substituted.

Ashes and other heavy refuse are commonly and satisfactorily disposed of by dumping at sea, subject to federal control, but unless crates, laths and other light materials are carefully separated and removed, there remains an unsightly residue on the surface that is liable to litter up the beaches.

#### V. INCINERATION

Incineration provides one of the most sanitary methods of refuse disposal, if the incinerators are properly designed, constructed and maintained. There has

\* In a recent case, officially reported, "the result is that residents in the vicinity of the stream deposit all household garbage as well as every other kind of rubbish and waste . . . in its channel. During the warm months of the year it is a shocking spectacle and it is alleged the odor at times is so bad that residents have to leave their houses."

"An official of one community, through which runs one of our finest rivers, very frankly stated to a representative of the Commission that the customary method of garbage disposal was to empty the garbage cans at night from the bridge over the river."—*1st Bien. Rep.*, Conn. State Water Com., 1925-1926.

been a noticeable trend toward incineration during the past few years which should result in the gradual reduction of offensive refuse dumps on the outskirts of cities and villages. The movement started by many villages to construct an incinerator on a coöperative plan is to be encouraged.

One of the most important factors to be considered in connection with the establishment of an incinerator, from an economic as well as from a sanitary standpoint, is its location. Since incineration is rarely a revenue producing means of disposal, the location of the incinerator near the center of the garbage production area is desirable, to offset the economical advantages of other systems. The site selected should not be in a residential section, or where a nuisance will be caused by the congregation of vehicles and apparatus in the vicinity. The incineration plant should not be located in a ravine, where the hills above the plant are built up with residences; for it has been found that where homes are at practically the same elevation as the top of the stack of the plant, at times nuisances may be created by odors before dispersion into the atmosphere can take place. This is particularly true at times when the incinerator is being put in operation.

It is of the utmost importance that careful attention be given to the design and construction of the incinerator itself. Owing to the strong competition among manufacturers, important parts in the design which are necessary for proper operation from a sanitary standpoint, may be omitted in order to compete with manufacturers selling an inferior product. Often a real reason behind this may be loosely written specifications. Attention is called to a report of this committee for the year 1925.<sup>1</sup> Among the most essential features which should be considered for sanitary reasons are a combustion chamber of suitable size and arrangements to facilitate combustion and arrest dust; provision of sufficient pre-heated air with forced draft to maintain high temperatures; and a sufficiently high stack to carry off and disperse the products of combustion.

The operation of the plant is most important. No matter how well the plant may be designed and constructed, unless it is carefully operated and maintained, nuisances may result. The charging chambers should not be overloaded; in other words, the plant should be sufficiently large to allow for flexibility of operation. A minimum combustion chamber temperature of 1,250° F. should be maintained, and the average should be 1,400° F., or even higher for some types of plants, in order to give complete combustion. This is essential to the prevention of objectionable odors.

The addition of fuel to garbage, if required to effect combustion, is one of the drawbacks of the incineration method. If sufficient rubbish can be collected, it may not be necessary to add other fuel. A mixture of at least 35 per cent of rubbish by weight with 65 per cent of garbage is usually necessary to insure proper burning. At one of the large cities in the central part of New York State, waste crank-case oil is collected in drums and used in the furnaces when large quantities of waste vegetables, such as celery and cabbage, are received in truck loads from wholesale merchants. This has been found very useful at such times and it also serves to keep this objectionable oil out of the public sewer system.

The incineration plant and its surroundings should be maintained in a sanitary condition at all times. The garbage should be handled as rapidly and as uniformly as possible so that no large accumulations exist. This will prevent nuisances from odors as well as from flies. No dirty vehicles nor apparatus should be left around the plant and the floors and walls of the building should be kept clean.

## VI. HOG FEEDING

Hog feeding has the advantages of utilizing the food value of garbage, and of potential profit from the sale of pork. A large initial investment is necessary, however, and there is danger of heavy loss from sickness in the herds. Unless rigidly controlled this method is subject to nuisance. It provides disposal for garbage only, ashes and rubbish being taken care of as before described.

Piggeries should be maintained only in places very remote from habitations even when properly supervised and with every precaution to prevent a nuisance. The hog houses or shelters should be cleaned daily and the cleanings disposed of in a sanitary manner, such as by burial or by plowing into the ground as fertilizer. The residue from hog feeding often amounts to about half the weight of the garbage. Attempts to produce fertilizer of the residue by drying and grinding have only been partially successful.

At least 100 hogs are necessary to dispose of 1 ton of garbage per day.

There are two methods of feeding: upon platforms and upon the ground. If platforms are provided, they should be of concrete. These are preferably enclosed in a building, thereby preventing the spread of odor and providing shelter in winter. The uneaten garbage should be hauled and buried and the platforms cleaned daily. Hogs should be fed upon the ground only where a large area is available so that the place of feeding may be changed often. The top soil should be plowed under frequently. Manure and other residue should be removed at regular intervals and the yards kept in as sanitary a condition as possible. It has been found difficult to maintain large piggeries without creating serious nuisance, except in the most remote places.

To avoid losses from death all hogs on arrival should be immunized against hog cholera. The garbage fed to them should be fresh, and care should be taken to eliminate razor blades, victrola needles and broken glass. Even with care losses from such things will probably amount to from 3 to 5 per cent annually. Hogs will consume from 12 to 30 (average 20) lb. of garbage and take on an average weight of 1 lb. per day each, or about 40 lb. per ton of garbage. To keep down the nuisance of flies a mixture of 4 lb. cresol, 4 lb. oil of Myrbane in 48 gal. of stove distillate, sprayed twice a day (being careful to avoid spraying the hogs themselves), has been found efficacious.

There seems to be no foundation for the common belief that garbage fed pork is less wholesome than grain fed pork. "With proper management the meat produced is equal to and cannot be distinguished from grain fed hogs."<sup>2</sup> It is true, however, that the grain fed hog increases somewhat more rapidly in weight.

## VII. REDUCTION

As in the case of hog feeding, reduction and fermentation processes are applicable to garbage only, which should therefore not be wrapped at the source.

Reduction processes possess merit in the conservation of the grease and the fertilizer ingredients as separate merchantable products. Methods vary in detail, but as generally carried out the garbage is cooked in a digester by steam, freeing the grease with or without a solvent, such as naphtha, and then the residue, known as tankage, is pressed. The drainage or "stick liquor" flows to a tank where the grease is skimmed off and any grease left in the tankage is removed by percolating with solvent and recovered. The tankage is then ground as fertilizer. The stick liquor is sometimes used to enrich the tankage but whatever is discharged is highly putrescible and requires ample dilution.

Owing to the fluctuation of market prices for grease and tankage the revenue cannot be closely predicted. With large, well-conducted plants a profit may be realized, but with the prices that have held since the war a net revenue has been exceptional. For this reason and the fact that reduction plants are expensive to construct and maintain and generally result in a greater cost for haul than incinerators (as they are most economically operated in large units), and also because they are more liable to nuisance, few plants have been built in recent years.

The greater probability of nuisance is due to drainage of the stored raw garbage and in general to the greater difficulty in keeping the plant clean, but especially to the liability of offensive gases to escape during processes of percolation and drying, and from leaky pipes and fixtures. The waste liquor too is apt to contain more or less offensive putrescible material mixed or combined with solvent, setting free obnoxious odors that have been discerned at a distance of 8 miles. So far as possible, however, the solvent is recovered and used over again.

In the best modern plants, where no solvent is circulated in a closed system, and with care in operation, these odors can be controlled, and the plant may be centrally located without offense.

Reduction plants require careful supervision, and revenue should be of secondary consideration. For this reason they should be operated by the municipality. They are generally not to be recommended for towns of less than 80,000 inhabitants.

#### VIII. FERMENTATION

The fermentation of garbage, developed in Italy as the Beccari System, has the advantage of requiring a minimum of mechanical equipment and attendance. It appears to have been very successful in some of the larger Italian cities, but with the different quality of American garbage certain modifications appear to be desirable to reduce the moisture and to promote decomposition with freedom from odor. Experience in America is too limited to specify details, but it appears entirely practicable to obtain a fairly dry, innocuous product within 40 days' decomposition by providing ample aeration in the cell and by the addition of about 30 lb. calcium oxide and 1 lb. ammonium sulphate per ton of raw garbage. The weight of the humus produced is about 12 per cent of that of the raw garbage, and, after a few hours' air-drying, can be ground and sold as fertilizer.

By this program, odors which were formerly found objectionable on drawing the charge are avoided.

The process has the merit of conserving the fertilizing properties of garbage, freedom from odor, elimination of harmful bacteria (by the heat evolved), and of inexpensive construction and operation. On the other hand the space required renders it less favorable for large cities with high land values than for suburban communities and small towns.

#### IX. SUMMARY OF CONCLUSIONS

##### *House Preparation*

1. Refuse should receive the proper degree of separation.
2. Garbage should be drained. If it is to be incinerated, it may be wrapped.
3. Receptacles should be of metal, water-tight and fly-proof. They should be kept covered, placed at the properly designated point of collection and cleaned to prevent odor.
4. Cans, metal and glass may be placed with the ashes in metal cans, but

paper should be excluded. If not too bulky, paper, cans and metals without sharp edges may be collected in stout bags of canvas or burlap. Mixed refuse should be treated as provided for garbage; but if without garbage, it should be treated as provided for ashes.

### *Transportation*

1. Any scheme of collection should be correlated to the length of haul, the method of disposal and whether refuse is combined or separate.

2. Garbage and inflammable refuse may be mixed if disposal is by incineration; otherwise separate collection is preferred.

3. Unless contractual conditions are carefully drawn municipal collection and disposal is desirable.

4. Wagons or trucks and containers should be of metal and washed or disinfected daily.

5. The bodies of wagons or trucks should be hung as low as practicable for convenience, and provided with covers.

### *Disposal on Land*

1. Ashes, metals, glass and crockery may be dumped on land, but paper, boxes, etc., should be separated out and all fires extinguished.

2. Dumps of mixed refuse, where necessary, should be made with garbage at the bottom, ashes on top and the exposed surface promptly covered with at least 4" of earth.

3. Dumps should be located at remote points and not along the banks of watercourses.

4. Garbage may be buried in trenches 12" deep to a depth of 6" and covered with at least 6" of earth.

### *Dumping at Sea*

This is a satisfactory method of disposal for ashes and other heavy material provided that all wood and other nonsinkable material is carefully excluded, but it is not desirable for garbage.

### *Incineration*

1. The incinerator should be placed in an industrial location but not in a ravine, where the gases of combustion might reach habitations.

2. To avoid the use of fuel the charge should consist of at least 35 per cent rubbish by weight with 65 per cent garbage.

3. Combustion chamber temperatures should be maintained above 1,250° F., and average at least 1,400° F.

4. The plant and its surroundings should be kept in a clean condition.

### *Hog Feeding*

1. Piggeries should be located at a distance from habitations.

2. The hog houses, grounds and feeding platforms should be kept clean and all refuse promptly removed and plowed under or buried. Feeding platforms should, if possible, be enclosed.

3. Garbage fed to hogs should be free from injurious substances and in a fresh condition.

4. All hogs should be inoculated on arrival for hog cholera.

5. Flies should be kept from breeding by the application of suitable chemicals as a spray or otherwise.

*Reduction*

1. The raw garbage should be drained but not held in storage long enough to putresce.
2. The solvent or drainage liquors containing solvent mixed with organic matter should not come in contact with the outside air.
3. Reduction plants require intelligent supervision. Care should be taken to keep the plant in a clean condition and to repair all leaks and other defects without delay.
4. Reduction plants should only be considered in the case of large cities.

*Fermentation*

1. Fermentation plants require careful design, and intelligence in operation.
2. Fermentation plants may prove, with further experience, adapted to suburban or rural communities, where land is not too costly and where a local market for the product as fertilizer can be assured; but as yet they must be considered as in the experimental stage.

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\* Concurring in all general matters.

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## Argentina League of Mental Hygiene

THE Argentinian League of Mental Hygiene was established in Buenos Aires on December 6, 1929, through the influence of the Society of Neurology and Psychiatry. The League will study and put in practice means for the prevention of mental disorders. It will work for the application of mental hygiene in schools, industrial establishments, and other places, and for the improvement of the methods of treating mentally ill persons. It is hoped that these aims will be realized through the organizing of congresses and conferences and the enlisting of the cooperation of the public authorities.—*Semana Med.*, Buenos Aires, Jan. 30, 1930, p. 320.



## EDITORIAL SECTION

*Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.*

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## SERUM TREATMENT OF MENINGITIS

THE use of antimeningococcic serum for the treatment of cerebro-spinal meningitis is an accepted procedure, the usefulness of which is generally admitted. There are, however, rumors and even published reports that antimeningococcic serum is not accomplishing all that might be desired. In the epidemic reported by Anderson two of the serums employed (one of which was produced by a state laboratory) appeared to be of definitely more value than others which should have been of equal excellence. This should not imply laxity on the part of any or all of the commercial manufacturers but is, rather, a reflection on our lack of adequate laboratory methods for determining in advance the therapeutic activity of these serums.

Determination of the potency of antimeningococcic serum is now based almost entirely on its content in agglutinins (or complement-fixing antibodies) for certain type strains. This method is preferred to others largely because of its simplicity and because the results obtained with it can be readily repeated. Other methods, some of which involve the use of animals, have been suggested but are not widely employed. There is, in truth, no reliable method at present available. To quote Dr. McCoy, "There is hardly any more unsatisfactory standardization in connection with biological products than the present-day standardization of antimeningococcus serum."

One point of value in treating meningitis cases is that a patient who is doing poorly under treatment with one batch of serum may improve under treatment with another batch. It is not always necessary to obtain the product of a different manufacturer, for it will

sometimes happen that, of two lots made by the same manufacturer, one will be more efficacious than the other, in an individual case. Better results may be obtained if the infecting organism is isolated and tested for agglutinability by samples of several batches of serum; and then treatment is continued with that lot of serum which gives the best agglutination. Some of the cases reported have been so rapidly fatal that no serum could be of any possible value. Cases dying within 24 hours of admission to hospital were almost certainly beyond the aid of serum therapy at the time they entered the hospital.

At the moment, meningitis may still be listed among those diseases deserving further study, particularly from the standpoint of serum therapy. It is reasonable to believe that a well equipped group could expect to improve present methods and suggest means which would restore this serum therapy to at least the level which it attained some years ago and from which it is thought to have receded within the past few years. At present there is danger of the development of a do-nothing attitude which may lead to the abandonment of a reputedly valuable agent.

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## HEALTH COUNCILS

SYMPATHETIC coöperation of a constructive and preventive nature has become recognized as essential if community health and welfare organizations are to serve the public most effectively. As the public health program has broadened with the introduction of new lines of service and the emphasis on education in the principles of hygienic living, consideration has naturally been given to the relative values of different health activities. The Health Council plan has developed to meet the local needs for a coördinating and supporting voluntary body of representative public spirited citizens.

The Health Council is usually made up of a lay person and the executive of each private health agency, representatives of public health organizations, and members-at-large. This group constitutes the governing body.

The purposes of the Health Council are primarily as follows:

1. To promote the coördination of public and private health work.
2. To serve as a forum for the discussion of health and sickness problems, policies, and plans.
3. To develop new and to improve present standards of service through joint study of special problems.
4. To secure improvement of existing health facilities and services and the establishment of new or additional health facilities or services where needed.

5. To give moral support to the existing department of health, in coöperation with the local dental and medical societies.

The Cincinnati Public Health Federation was the first city Health Council organized. Such councils are now active in Allegheny County, Boston, Cincinnati, Cleveland, Denver, Louisville, Minneapolis, New Haven, San Francisco and Syracuse. Groups usually connected with a Council of Social Agencies or a Community Chest exist in some 20 cities for the purpose of rendering services somewhat similar to those of the 10 Health Councils. Massachusetts is the only state council formed. The National Health Council, established in 1920, included in its membership 15 national health agencies. It has recently been reorganized as primarily a service organization for purchases, library maintenance, and similar functions.

A primary function of a Health Council is the development of better understanding between the official and private health agencies of a city. Through special studies by executives and committees, many community health problems are carefully analyzed. Child hygiene, health education, mental hygiene, social hygiene, convalescent care, chronic diseases, dental care, public health nursing, tuberculosis, and industrial hygiene are among the problems which have been considered during the past year in an effort to secure sound program planning. Several stimulating public addresses have been sponsored, and important publications have resulted.

## SEWAGE AND CONSERVATION

TO a large proportion of our population, the thought of conservation in connection with sewage would seem preposterous, but to a small group, including health and municipal officials and a few industrialists, such is not the case. At the present time one of the problems in the sanitary engineering field receiving much thought and study is how to design a sewage treatment plant that will not only act as a device for innocuously caring for sewage but will at the same time produce some return even if it be more or less intangible.

Sewage farming, among the oldest of the sewage treatment processes, has a conservation phase to it but to a limited extent. The application of sewage to land not only in the negative light of using the land to dispose of the sewage but also in the positive way of utilizing the sewage to fertilize the land has been practiced for many years. In the sections of this country where water is scarce for agricultural purposes, the application of sewage to the land has served a useful purpose and has permitted the saving of other water more suitable for

higher uses. A recent statement indicates that in arid or semi-arid areas there is a decided tendency to turn further to land disposal.<sup>1</sup>

Attempts to use as a fertilizer the sludge which results from the treatment of sewage, both in its natural form and artificially improved, have been numerous. Reports as to the value of untreated sludge as a fertilizer have been conflicting, probably due to the variation in the sludges used. By adjusting the chemical make-up of a sludge as is done at Milwaukee, Wis.,<sup>2, 3</sup> it appears that greater success in its use as a fertilizer can be had. Although there may be no net income to a municipality in utilizing its sludge, such fertilizing value as it may have is not being completely lost.

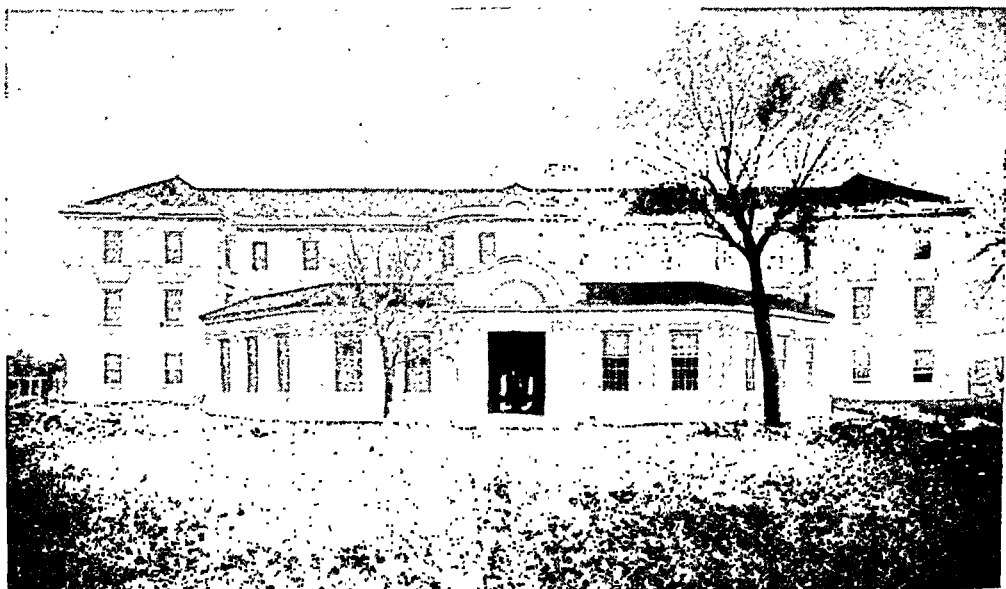
The first attempt in this country to utilize gas from Imhoff tanks was at the Peachtree sewage treatment plant in Atlanta, Ga., 1915. Since that time this practice has spread widely. In most cases, collected gas is put to some useful work, as at Birmingham, England,<sup>4</sup> and Charlotte, N. C., where it drives gas engines. Efforts are now being directed toward the stimulation of the digestion of sewage so as to produce more gas. This method of conserving an energy producer has merit and will probably go far.

The most recent attempts to get something useful out of sewage have been along the lines of reclamation. The cost of hauling fresh water into the Grand Canyon National Park<sup>5</sup> was a major factor in bringing about a sewage treatment plant design which would produce an effluent suitable for reuse as boiler feed water. It is now reported<sup>6</sup> that a large oil company will attempt to reclaim 6 million gallons of Los Angeles sewage for the same purpose, and that the city of Los Angeles has taken its first step toward the reclamation of some of its sewage to replenish the underground water supply and for industrial uses.

The health of the public benefits through the proper treatment of sewage and if this conservation viewpoint stimulates more sewage treatment, it is acting indirectly as a favorable factor in public health work.

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5. Hommon, H. B. Sewage Treatment Plant at the Grand Canyon National Park, *Reprint No. 1249*, *Pub. Health Rep.*, Oct. 5, 1928.
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*Cooke Memorial Hospital, Fort Worth, Texas  
Considered the most beautiful in the South*

## THE HOST-CITY FOR 1930

IRA C. CHASE, M. D.

*Advisory Council of the Department of Public Health and Welfare,  
and Vice Chairman, Citizens' Committee, Fort Worth, Tex.*

THE next meeting of the A. P. H. A. will convene in Fort Worth, Tex., October 27. You who attend will of course have first interest in the real Association work. When you step from the airplane or Pullman you may be interested to know that you are in a "Town that Jack Built"; that is, a one-generation town, conjured into existence by poor, energetic, virile empire builders. Think of a set of men who can in their lifetime transform a prairie into a city of 200,000 population, build its skyscrapers, pave its 86 miles of streets, erect its hotels and banks, its 57 schools for 35,000 children, 206 churches, 11 hospitals, 19 lines of railway outlet, lay out 43 parks, provide water and sewage systems, colleges, libraries, aviation fields, etc. Look at Fort Worth from this angle.

Fort Worth is about midway between the Atlantic and Pacific Oceans, 323 miles from the Gulf of Mexico, 717 miles south of St. Louis. Its elevation is

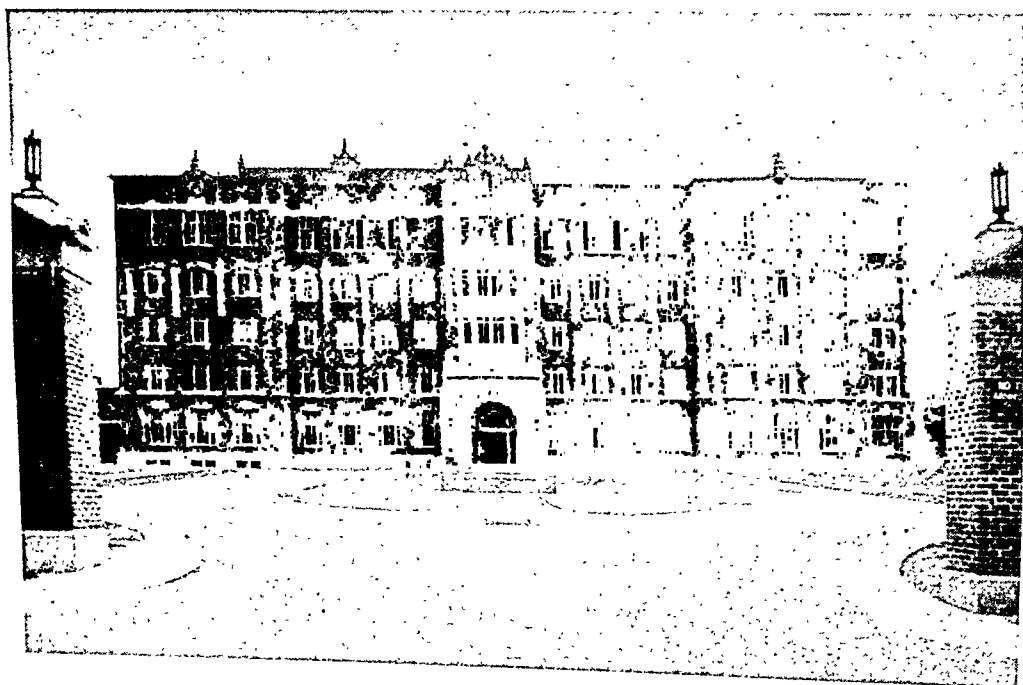
670 feet; climate is dry and mild, with a mean temperature of 65.2°; the heat of summer is modified at night by the monsoon winds drawn from the Gulf toward the heated, arid plains of the Northwest. It is one of the most healthful parts of the United States.

In the old days settlers first "fell on their knees and then on the aborigines"; churches and forts were of first importance. A modern settlement clusters about pure water, sewage disposal, health department and hospitals; schools, churches, courts and jails are secondary.

This "Town that Jack Built" is planned in a modern manner, and the result is that Fort Worth has the lowest death rate of the principal cities of the South and ranks third in cities of 100,000 or more in the United States. Great artificial lakes supply filtered and treated water. Extensive sewerage and disposal plants complete the system. A real American Public Health and Wel-



*New Methodist Hospital, Fort Worth, Texas*



*St. Joseph's Hospital, Fort Worth, Texas*

fare Department is a part of the City Government. Eleven hospitals provide care, one the most beautiful in the South, another of 400 beds unexcelled in the United States.

Here is the home of the State Medical Association of Texas, with its 3,800 members, and the headquarters of the *State Medical Journal*. Here is a County Medical Society of 180 physicians, all eager to make the meeting of the A. P. H. A. a success.

Within a few hours' ride is the

"Heart of the Cow Country," the Swenson ranches, where novelists prepare their material and artists get their poses and inspiration. Here is given the world's greatest rodeo annually. Here is the greatest oil-line center of the world, with 8 refineries, the greatest packing industry in the South, the greatest food distributing point and the largest manufacturing center of the Southwest. Take a look at a "Town that Jack Built." It is an inspiration to an American.

## ASSOCIATION NEWS

### MEETING OF EXECUTIVE BOARD

A MEETING of the Executive Board of the American Public Health Association was held on April 5 in the headquarters office, with all members of the Board present, together with the chairmen of three of the four standing committees.

*Financial Report*—The Board received the report of the financial condition of the Association at the end of the first quarter, which showed a total income of \$65,167.94, and a total expenditure of \$42,250.48, with all committees operating well within the budget allotments.

*Section Appropriations*—Upon the recommendation of the Finance Committee, the Board approved a budget of \$2,000 for expenditures of the sections, this sum to be drawn on by the several section secretaries in accordance with budgets submitted, and for items approved by the Treasurer and Executive Secretary. Authorized expenditures will cover postage, stenographic service, telegrams, long distance telephone calls, and similar expenditures of the secre-

taries for section business which cannot easily be provided by the administrative office.

*Grant from Commonwealth Fund*—Upon the recommendation of the Finance Committee the Board accepted a grant of \$3,000 from the Commonwealth Fund, to be used for the training of an additional field worker under the Committee on Administrative Practice.

*Life Membership Fund*—Upon the recommendation of the Finance Committee the Board established a Life Membership Fund to which are to be deposited directly all dues from Life Members, the income from the Fund to be paid into current income of the Association and the capital fund to be held for future disposition by the Board.

*Constitution for the Western Branch*—A tentative draft of a Constitution and By-laws of the Western Branch of the American Public Health Association was submitted to the Board. Several provisions of this Constitution and By-laws were approved in principal by the

Board, and the Secretary of the Western Branch and the Executive Secretary of the Association were instructed to prepare in consultation a final draft for approval by the Board and the Western Branch members at the meeting in Salt Lake City in June.

*Committee on Meetings and Publications*—The Board received the report of the Committee on Meetings and Publications which recommended that, following the Fort Worth meeting, there be arranged a trip to Mexico City in response to an invitation from the Chief of the Public Health Service of Mexico, and approved plans for this trip and a scientific program to be arranged in Mexico City.

The committee also reported on the activities of the Sub-committees on Annual Meeting Program and Syndicated Public Health Bulletin.

At the conclusion of his report, the chairman, Abel Wolman, tendered his resignation as chairman of the Committee, expressing his appreciation of the assistance of members of the Executive Board, his committee and the staff.

To succeed Mr. Wolman as Chairman of the Committee on Meetings and Publications, the Executive Board elected C. C. Young, D.P.H., of Lansing, Mich.

*Committee on Fellowship and Membership*—A report was received from the Committee on Fellowship and Membership outlining its activities in the promotion of sustaining and active membership. The committee announced the appointment of Carl E. Buck, Dr.P.H., as Chairman of the Sub-committee on Membership Promotion.

*Committee on Administrative Practice*—The report of the Committee on Administrative Practice, presented by Louis I. Dublin, Ph.D., announced completion of surveys and appraisals in Athens and Clarke County, Ga.,

Rutherford County, Gibson County, and Sullivan County, Tenn., and Washington, D. C. Arrangements have been completed for further surveys during 1930 in Memphis, Tenn., Kansas City, Mo., Fargo, N. D., and Marion County, Ore. The annual consultation service is to be extended as in the past to Detroit, Mich., Monmouth County and Newark, N. J., and Montreal, Canada.

The report indicated that the field work of the study of rural health work will probably be completed in November, and this will include detailed surveys of 50 county health organizations. The first analysis is expected to be completed about June 30, 1931.

The committee reported that 140 cities had been entered in the Health Conservation Contest of the U. S. Chamber of Commerce and, of this, 108 had returned completed schedules. These returns were carefully graded by the Grading Committee on April 4, and recommendations of this committee transmitted to the Board of Judges of the Chamber of Commerce of the United States. Eighty-seven of the cities entered in the contest have received consultant service from the Association.

The Sub-committee on Record Forms is negotiating for the printing of record forms approved by the committee.

The Sub-committee on the Evaluation of Administrative Practice is outlining a program of research and is considering the fields of diphtheria and scarlet fever control for its studies.

The special committee to revise the report on community health organization expects this revision will be completed before the Fort Worth meeting.

*Committee on Research and Standards*—Abel Wolman, Chairman of this Committee, reported that pending completion of the organization of the committee there was no work to report.

Upon the nomination of Mr. Wolman the following were elected members of



the Committee on Research and Standards:

W. H. Frost, M.D.  
 Edwin O. Jordan, Ph.D.  
 Haven Emerson, M.D.  
 Isidore S. Falk, Ph.D.  
 George W. Fuller  
 Prof. Henry C. Sherman  
 Edgar Sydenstricker  
 William H. Park, M.D.  
 Prof. C. E. Turner  
 Thomas Parran, M.D.  
 A. Parker Hitchens  
 L. R. Thompson, M.D.

The chairman requested permission to defer appointment of the two additional members prescribed by the By-laws until such time as the committee has actually begun work, to permit the addition of other members representing the special fields of activity which may be entered.

*Report of Secretary of Minneapolis Local Committee*—The Board acknowledged receipt of the report and directed the Chairman of the Board to express to the Minneapolis Local Committee the appreciation of the Association for the suggestions for the improvement of future annual meetings.

*Committee to Coöperate with the Director of the Census*—The resignation of Dr. Chapin as Chairman of this committee was presented and accepted by the Board. Dr. Emerson was appointed Chairman, and George H. Van Buren was appointed to fill the vacancy.

*Allocation of Committees*—A special committee consisting of Dr. Emerson, Mr. Wolman, and Miss Jean, appointed to consider the allocation of Association

and section committees to the four standing committees of the Association, presented its report with a suggested plan of allocation, and this was accepted by the Board and will be brought to the attention of the sections and committees concerned.

*Policy on Committee Appointments*—Two important matters of policy were definitely decided by the Board, namely, that the staff members of the Association should not be considered to be ineligible for appointment to Association committees, and that those who are not members of the Association may under special circumstances be appointed to Association committees.

*Requests for Endorsement*—Several requests for endorsement were received by the Board from national and state organizations related to the field of public health, and the Executive Secretary was authorized to express to these organizations that it was not in accordance with the policy of the Association to give such endorsements.

*Constitution*—The Constitution of the Association adopted at the Minneapolis Annual Meeting was referred by the Governing Council to the Executive Board for editing as to legal terminology, and the edited Constitution was approved by the Executive Board. (This will be printed in an early issue of the JOURNAL.)

*Report of Nominating Committee*—Dr. Ferrell, the Chairman of the Nominating Committee, presented the report of the committee listing 25 nominees to be voted upon for membership in the Governing Council at Fort Worth.

#### NOMINATIONS FOR THE GOVERNING COUNCIL

IN accordance with the By-laws of the Association the Nominating Committee reports the following nominations for the Governing Council. The Constitution provides that "upon the petition

of twenty-five Fellows, the Nominating Committee shall add the name of any Fellow to this list, providing such petition is received 15 days before the Annual Meeting."

The ten Fellows receiving the highest number of votes or a written ballot cast by the Fellows present and voting at the Annual Meeting in Fort Worth will be elected for the three-year term, 1930-1933.

Fred Adams, M.B., D.P.H., Health Officer, Windsor, Ontario, Medical Officer of Health  
John A. Amyot, M.B., Deputy Minister of Health, Ottawa, Ontario

Donald B. Armstrong, M.D., Assistant Secretary, Welfare Department, Metropolitan Life Insurance Company, New York, N. Y.

George H. Bigelow, M.D., State Commissioner of Health, Boston, Mass.

Robert S. Breed, Ph.D., Chief in Research, New York Agricultural Experiment Station, Geneva, N. Y.

Paul B. Brooks, M.D., Deputy State Commissioner of Health, Albany, N. Y.

Francis P. Denny, M.D., Health Officer, Brookline, Mass.

Livingston Farrand, M.D., President Cornell University, Ithaca, N. Y.

J. G. Fitzgerald, M.D., Professor of Hygiene and Preventive Medicine, University of Toronto, Toronto, Ontario

Edward S. Godfrey, Jr., M.D., Director, Division of Communicable Diseases, State Department of Health, Albany, N. Y.

Paul Hansen, Consulting Engineer, Pearse,

Greeley & Hansen, Chicago, Ill.

Emery R. Hayhurst, M.D., College of Medicine, Ohio State University, Columbus, O.

Professor William C. Hoad, Professor of Sanitary Engineering, University of Michigan, Ann Arbor, Mich.

Guy L. Kiefer, M.D., State Health Commissioner, Lansing, Mich.

J. H. M. Knox, M.D., State Department of Health, Baltimore, Md.

George S. Lockett, M.D., Director of Public Health, Santa Fe, N. M.

Bleeker Marquette, Executive Secretary, Public Health Federation, Cincinnati, O.

E. V. McCollum, Ph.D., Johns Hopkins University, Baltimore, Md.

Milton J. Rosenau, M.D., Professor of Preventive Medicine, Harvard Medical School, Boston, Mass.

Grace Ross, R.N., Superintendent of Nursing, Department of Health, Detroit, Mich.

F. F. Russell, M.D., Director International Health Division, New York, N. Y.

W. L. Stevenson, Chief Engineer, State Department of Health, Harrisburg, Pa.

Professor John Sundwall, University of Michigan, Ann Arbor, Mich.

Edgar Sydenstricker, Milbank Memorial Fund, New York, N. Y.

Robert Spurr Weston, Boston, Mass.

JOHN A. FERRELL, M.D.,

*Chairman*

TENTATIVE PROGRAM—FIRST MEETING  
WESTERN BRANCH  
AMERICAN PUBLIC HEALTH ASSOCIATION  
*Hotel Utah, Salt Lake City, Utah*  
*June 12, 13 and 14, 1930*

*Thursday, June 12*

8:00 A.M.—Registration of delegates and visitors.

10:30 A.M.—Call to order by W. C. HASSLER, M.D., San Francisco, Calif., President Western Branch A. P. H. A.

1. Address of Welcome—HON. GEORGE H. DERN, Governor of Utah, Salt Lake City.

2. Response—W. C. HASSLER, M.D.

3. Report of Secretary—W. P. SHEPARD, M.D., San Francisco.

4. Announcements—T. B. BEATTY, M.D., State Health Officer of Utah, *Chairman*, Committee on Local Arrangements.

12:30 P.M.—General Luncheon—all members—Presiding: W. C. HASSLER, M.D.  
Round Table Introductions.

Address—Relationships between A. P. H. A. and Western Branch, A. J. CHESLEY, M.D., Minnesota State Health Officer, President, A. P. H. A.

2:00 P.M.—Scientific Session—Presiding: W. F. COGSWELL, M.D., Helena, Mont.

1. New Aspects of Tuberculosis Prevention, J. A. MYERS, M.D., Minneapolis, Minn.

Discussion opened by: J. J. WARING, M.D., Denver, Colo.

2. The Epidemiology of Tuberculosis, H. W. HILL, M.D., Vancouver, B. C.

Discussion opened by: ALEXIUS M. FORSTER, M.D., Cragmor, Colo.

3. The Organization of Tropical Medicine in Western United States, A. C. REED, M.D., San Francisco, Calif.

4. Observations on the Epidemiology of Undulant Fever in Los Angeles County, Calif., GEORGE H. ROTH, M.D., and R. V. STONE, D.V.M., Los Angeles, Calif.

Discussion opened by: K. F. MEYER, M.D., San Francisco, Calif.

7:00 P.M.—Business Meeting—Presiding: W. C. HASSLER, M.D.

1. Report of Secretary—Minutes of Last Meeting.
2. Report of Committees:  
Committee on Constitution and By-Laws—GUY S. MILLBURY, D.D.S., *Chairman*.
3. Discussion, revision and adoption of Constitution and By-Laws.
4. Appointment of Committees *pro tem.*:  
Resolutions.  
Time and Place of Next Meeting.  
Nominating.  
Finance.

8:00 P.M.—Public Meeting—Presiding: H. P. KIRTLEY, M.D., Salt Lake City, Utah.  
Address: (Subject to be Announced), LEE K. FRANKEL, PH.D., New York, N. Y.

#### Friday, June 13

9:00 A.M.—Symposium on Meningitis—Presiding: FREDERICK D. STRICKER, M.D., Portland, Ore.

1. Bacteriology and Serology of Meningococcus, E. C. DICKSON, M.D., San Francisco, Calif.
2. Epidemiology of Meningitis, KARL F. MEYER, M.D., San Francisco, Calif.
3. Source and Incidence of 1928 Western Outbreak, J. C. PERRY, M.D., San Francisco, Calif.
4. Oriental Importation, GEORGE PARRISH, M.D., Los Angeles, Calif. WILLIAM C. HASSLER, M.D., San Francisco, Calif. E. T. HANLEY, M.D., Seattle, Wash. C. P. BROWN, M.D., Victoria, B. C.
5. Intermountain Incidence, W. F. COGSWELL, M.D., Helena, Mont. B. B. JAFFA, M.D., Denver, Colo. WILLIAM CHRISTOPHERSON, M.D., Salt Lake City, Utah. T. B. BEATTY, M.D., Salt Lake City, Utah. F. W. ALMOND, M.D., Boise, Idaho.

Discussion opened by: A. J. CHESLEY, M.D., St. Paul, Minn.

2:00 P.M.—General Scientific Session—Presiding: WALTER M. DICKIE, M.D., Sacramento, Calif.

1. Rocky Mountain Spotted Fever, R. R. PARKER, M.D., Hamilton, Mont.

Discussion opened by: W. F. COGSWELL, M.D., Helena, Mont.

2. The Possibility of Controlling Ticks by Parasites, PROF. R. A. COOLEY, Bozeman, Mont.

Discussion opened by: W. J. BUTLER, M.D., Helena, Mont.

3. Public Health Training for Western Health Officers, J. C. GEIGER, M.D., San Francisco, Calif.

Discussion opened by: P. COVINGTON, M.D., Salt Lake City, Utah.

4. Results and Effectiveness of Recent A. P. H. A. Survey in Hawaii, F. E. TROTTER, M.D., Honolulu, Hawaii.
5. Relationship of Health Departments to Industrial Hygiene, C. O. SAPPINGTON, M.D., Chicago, Ill.

7:00 P.M.—Business Meeting—Presiding: W. C. HASSLER, M.D.

1. Report of Nominating Committee.
2. Election of Officers.
3. New Business.

8:00 P.M.—Public Meeting—Presiding: H. P. KIRTLEY, M.D., Salt Lake City, Utah.

Address—The White House Conference on Child Health and Protection, H. E. BARNARD, M.D., Washington, D. C.

#### Saturday, June 14

10:00 A.M.—Symposium on Sanitary Aspects of Proposed Boulder Dam—Presiding: R. J. STROUD, M.D., Phoenix, Ariz.

1. The Sanitary Engineering Aspect, PROF. LEON B. REYNOLDS, Stanford University, Calif.
2. The Immigration Aspect, FRED T. FOARD, M.D., Stockton, Calif.
3. Waste and Sewage Disposal Problem, HARRY HOMMON, San Francisco, Calif.  
Discussion opened by: EDWARD E. HAMER, M.D., Carson City, Nev.

2:00 P.M.—School Health Program—Presiding: C. K. MACEY, Boise, Ida.

1. Western Health Education, SALLY LUCAS JEAN, Health Education Consultant, New York, N. Y.

Discussion opened by: AMY LYMAN, Women's Auxiliary, Church of Latter Day Saints, Salt Lake City, Utah.

2. Nutrition and Dental Caries—  
Discussion opened by: HYRUM BERGSTROM, M.D., Salt Lake City, Utah.
3. Public Health Nursing in the West, ELIZABETH SOULE, Seattle, Wash.
4. How Shall We Attack the Problem of Preventive Dentistry? GUY S. MILLBURY, D.D.S., San Francisco, Calif.

Discussion opened by: HARRY B. TALLELM, M.D., Denver, Colo.  
 7:00 P.M.—Annual Dinner—Presiding: W. C. HASSLER, M.D.  
 1. Presidential Address—W. C. HASSLER, M.D.

2. Installation of New Officers.
3. Appointment Standing Committees.
4. Report of Resolutions Committee.
5. Address—A. J. CHESLEY, M.D.
6. Adjournment.

#### COMMITTEE ON ANNUAL MEETING PROGRAM

THE second meeting of the Committee on Annual Meeting Program was held on Friday, April 4, with 18 people present including Section Secretaries. Mr. Eggert reported on behalf of the Fort Worth Committee on Local Arrangements. He said that the committee has been successful in concentrating most of the meetings in the headquarters hotel. He stated that all of the commercial and educational exhibits would be held in the Hotel Texas also. A number of inspection trips of interest to the delegates have been planned. Some of these mentioned were: Swift and Armour Packing Plants, Sewage Disposal Plant, Water Purification Plants, Municipal Air Ports, Hospitals, Child Health Centers, Tour of North Side of Lake Worth, Tour of City, Trip to Local Health Department, Tea at Women's Club, Tea at Golf Course, Drive, and Theatre Party.

Mr. Eggert read a letter from Dr. Rafael Silva, Director General, Departamento Salubridad Publica, Mexico, D. F., appointing 5 official delegates from his department to the meeting, not including himself. These delegates will present papers (subjects to be announced later) in the following sections:

- Dr. Salvador Bermudez: Health Officers and Epidemiology
- Dr. Manuel Martinez Baez: Public Health Education and Vital Statistics
- Dr. Pedro Perez Grovas: Laboratory and Food, Drugs and Nutrition
- Dr. Mario Torroella: Child Hygiene and Public Health Nursing

Joaquin M. Segura: Public Health Engineering and Industrial Hygiene

Mr. Eggert reported further on the proposed post-convention tour to Mexico City. The tour was recommended to the Executive Board for approval, and further details concerning the trip will be found on page 530 of this JOURNAL.

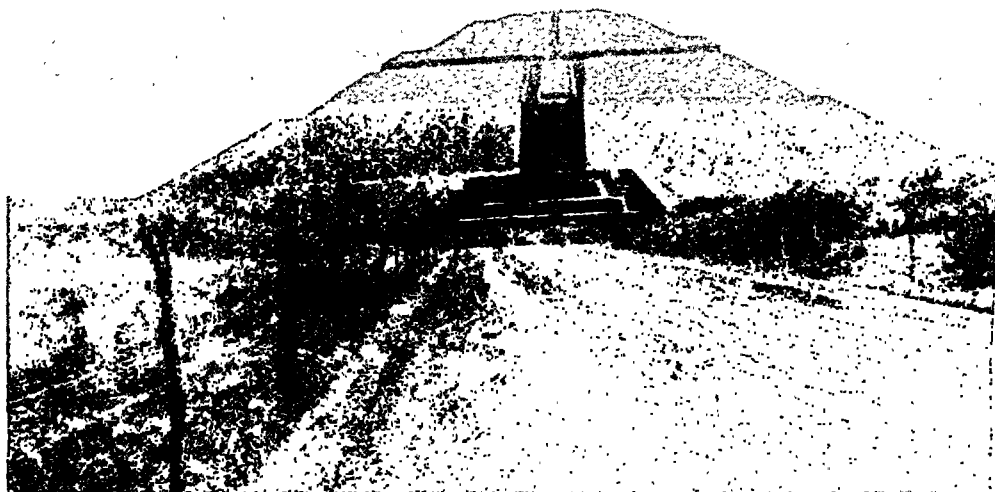
Section representatives reported for their sections. The Vital Statistics and Industrial Hygiene Sections requested that they be allowed four and three individual sessions respectively, instead of the two which had previously been allotted them.

The complete preliminary program will be published in the September issue of the JOURNAL.

It was announced that the Texas Association of Sanitarians, the State Conference of Sanitary Engineers, and the American Association of School Physicians are planning programs at the same time as the meeting of the American Public Health Association.

The committee voted to endorse the plan for arranging special trains from St. Louis to Fort Worth for those A. P. H. A. delegates who wish to take advantage of this convenience. Delegates will be requested to make their own arrangements for travel to St. Louis.

The usual convention rates will apply from all sections of the country to Fort Worth. Railroad rates will be published in the June JOURNAL with other information.



*Pyramid of the Sun, Teotihuacán, Mexico*

ANNOUNCING UNUSUAL 10-DAY POST-CONVENTION  
TOUR TO MEXICO CITY FROM FORT WORTH!

PRELIMINARY plans have been approved by the Executive Board to extend the Fort Worth sessions to Mexico City with a joint program of scientific sessions, inspection, and entertainment, on the invitation of official Mexico.

A splendid 4-day program in Mexico City has been authorized by President Rubio and Dr. Silva and their respective staffs, which includes seeing the volcanic mountains, pyramids, and everything of interest in a city considered second most beautiful on this continent.

The trip to and from Mexico City will be made in a special train, visiting interesting and scenic points enroute such as San Antonio, Monterrey, the beautiful Mountains of Mexico and the Magic Valley of Texas, where citrus fruit grows the year around.

The train will consist of the very highest type of equipment, offering the luxuries of home, assuring those making

the trip every minute of delight from the time they leave Fort Worth until their return to their homes.

While the class of train will be as high as any entering Mexico, the cost will be much lower than has been offered heretofore in comparable service.

The program in Mexico City, and maximum service at minimum cost in transportation, are being planned; also, arrangements will be made for members of the Association to receive specially advantageous rates from their point of departure including the Mexico City tour and return.

The tour will be limited to members of the Association, their families, and friends. A communication will be sent shortly to every member, submitting a detailed itinerary and further information about the trip.

Reservations are necessarily limited and therefore early reservation is greatly to be desired.

## NEW MEMBERS

### *Health Officers Section*

Charles W. Bartlett, M.D., Tampa, Fla., City Health Officer  
 Leo H. Flynn, M.D., Eau Claire, Wis., City Health Officer  
 Russell E. Hobbs, B.S., M.D., Wichita, Kans., Director of Public Welfare  
 Arthur McK. Shelamer, M.D., Union Springs, Ala., County Health Officer (Bullock)  
 Roy B. Jenkins, M.D., D.P.H., Edmonton, Alta., Canada, Medical Officer of Health  
 Joseph A. Preston, South Orange, N. J., Assistant Health Officer  
 Herman O. Hodson, Hillsboro, O., Health Commissioner, Highland County  
 D. R. Williams, M.D., Girard, O., Health Commissioner  
 Ferdinand M. Ferguson, B.S., M.D., Las Vegas, Nev., County Health Officer  
 Lester A. Round, Ph.D., Providence, R. I., Director of Public Health  
 Joseph F. Woodworth, Banff, Alta., Canada, Sanitary Inspector, Rocky Mountains Park  
 Loren Wallin, M.D., Natchez, Miss., Director, Adams County Health Department  
 John T. McGarry, Lyndhurst, N. J., Sanitary Inspector, Board of Health  
 Frederick T. Zieske, M.D., West Branch, Mich., Director, Consolidated Health Department, Dist. 2  
 Harry A. Reese, M.D., Yuma, Ariz., City and County Health Officer  
 Dr. Miguel E. Bustamante, Vera Cruz, Mex., Chief of Sanitary Unit  
 Nelson E. Newbury, M.D., Cambridge, Mass., Student in Harvard School of Public Health, formerly Director of Health of Scranton, Pa.

### *Laboratory Section*

Charles E. Holzer, M.D., Gallipolis, O., Owner of Holzer Hospital for private and public use  
 Temp J. Worrell, D.V.M., Pampa, Tex., City Inspector  
 William M. Groesbeck, Hornell, N. Y., Bacteriologist, Hornell Branch, Steuben County Laboratories  
 Kenneth W. Riley, A.B., Grand Forks, N. D., Bacteriologist and Chemist, N. D. Public Health Laboratories  
 Rosina R. Coulson, Arlington, N. J., Bacteriologist, formerly with State Department of Health, Boston, Mass.  
 Lawrence J. Peterson, B.S., Boise, Ida., State Bacteriologist

Grace Eldering, B.A., Lansing, Mich., Bacteriologist, Michigan State Health Laboratory

### *Public Health Engineering Section*

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**UNAFFILIATED:** Manton M. Carrick, M.D.,  
Dallas, Tex.

## INTERNATIONAL HYGIENE CONGRESSES IN DRESDEN

**A**BOUT 100 members of the Asso-  
ciation have joined the delegation  
of the A. P. H. A. to the International  
Hygiene Congresses in Dresden this  
summer. They will sail June 14 on  
the S.S. Adriatic.

They will attend the Congress of the  
Royal Sanitary Institute in Margate,  
England, June 25 to 28, and visit Lon-  
don, Brussels, Cologne, Wiesbaden,  
Vienna, Munich, Geneva, Lausanne and  
Paris. The stay in Paris will be coin-  
cident with The First International  
Congress on Micro-biology.

In addition to the regular features of  
the trip, special trips of scientific in-  
terest are being arranged in the cities  
visited.

Detailed information may be secured  
from Homer N. Calver, Executive  
Secretary, American Public Health As-  
sociation, 370 Seventh Avenue, New  
York, N. Y.

## CORRECTION

**W**E are glad to correct a wrong  
impression given by the news  
item in the March issue concerning the  
Washington, D. C., survey. The study  
of hospital administration is being made  
by A. C. Bachmeyer, M.D., superintend-  
ent of the Cincinnati General Hospital,  
assisted by Mary L. Hicks, executive  
secretary of the Health Council of the  
Louisville Community Chest. Neither  
the American Hospital Association nor  
the American Public Health Association  
feels that such intimate studies can be  
successfully carried on as an activity of  
a professional society but that they are  
better handled by an individual, and the  
city of Washington is fortunate in hav-  
ing so outstanding a person in the field  
of hospital administration to advise its  
local agencies on this matter.



# PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

**Health Inventory of New York City**—The Research Bureau of the Welfare Council has limited the scope of its study to questions relating to the volume of health service in New York City afforded by voluntary agencies and the relationship of the service rendered to the needs of the city. It has carried on its study in such a way as to parallel the inquiry made of the Health Department in 1926 by the American Public Health Association.

There are 300 agencies furnishing organized health services which are rendered either through clinics, home visits by the public health nurses, by health education or through institutions. The bed care of patients is not completely considered but rather does the study embrace the volume of service rendered through clinics, home visits and health education.

In 1926 it was shown that the New York City Health Department scored 63 per cent on the *Appraisal Form*. At this time complete data on the volume of service by unofficial agencies were not available. This additional information has been sought and the score raised to 70.9 per cent.

The health department maintains the majority of the infant welfare clinics in the city, 68 compared with the total of 37 furnished by all other agencies. Eighty per cent of the clinic attendance is at health department stations. For preschool hygiene the health department has provided no service. In the field of maternal hygiene the health department maintains 14 of the 91 available clinics. It furnishes a still

smaller proportion of clinic visits, but does provide 46 per cent of home visits in the field of maternal hygiene. Forty per cent of the tuberculosis clinics and about the same percentage of home visits are under the direction of the health department. Seven out of 141 clinics for venereal disease control are maintained by the department of health and receive 18 per cent of the total of 343,000 clinic visits.—*A Health Inventory of New York City*, Michael M. Davis and Mary C. Jarrett, Welfare Council of New York City.

**School Health Service in New York City**—Recommendations for the reorganization of the medical examination and health supervision of school children in New York City have been accepted by a committee consisting of representatives of the Department of Health, Department of Education and other health organizations.

Parents should appreciate that the prime responsibility for the health of their children rests in their hands. The plan of examination to be inaugurated in the schools is for those children who have not received the required examination from their own physicians. Those recommended for examination are: (a) all school applicants, before entering school; (b) all new children in kindergarten and first grades; (c) all in other elementary grades entering New York City schools for the first time; (d) all other children in elementary and junior high school grades found by teacher or nurse to have gross defects and those absent frequently on account of illness;

(e) all children in the 7th grade and those 13 years of age and above this age, who may be leaving school to enter industry; (f) all handicapped children to receive specialized examinations; (g) provision for reexamination and follow-up; (h) special examination for children entering competitive athletic sports.

The physical examinations are to be made by teams or groups consisting of 3 physicians, school nurses and clerks. Parents are to be invited to attend such examinations. Histories, testing of vision and hearing (except the entering grade), weights and measurements, are to be done in school prior to the medical examination. From the medical team one physician will be chosen to examine eyes, ears, vision and hearing; another heart, lungs and orthopedic condition; the third nose, throat, teeth, glands and skin. The record card is to be a combination of the scholastic and medical rating of the child.

The home follow-up for the correction of defects will be the responsibility of the school nurse. Children suspected of suffering from communicable disease will be visited by diagnosticians of the department. [This plan of the newly organized health service for school children in New York City is substantially identical with the plan which was developed and has been used so effectively in Detroit during the past 9 years.—Editor.] A Plan for the Medical Examination and Health Service of School Children of New York City, 1929—The Children's Welfare Federation, New York, N. Y.

**Health Administration in Racine, Wis.**—W. W. Bauer, M.D., Health Officer of Racine, has for the fifth consecutive year moulded his annual report around the *Appraisal Form for City Health Work* of the American Public Health Association. The department in 1929 rated 78.2 per cent, with a per-

fect score in vital statistics; 85 per cent in communicable disease control due to the failure of parents to avail themselves more extensively of diphtheria prevention and smallpox vaccination; 72 per cent for venereal disease control due largely to incomplete reporting; 96 per cent for tuberculosis control; 29 per cent for maternal hygiene due to the lack of prenatal clinic and field nursing service; 88 per cent for infant hygiene; 58 per cent for preschool hygiene (increased from 34 in 1928 due to special campaign); 87 per cent for school hygiene; 99 per cent for food and milk control; 89 per cent for sanitation; 96 per cent for public health instruction. Cancer control has also been included in the rating during the past 2 years and receives a credit of 43 for 1929. Heart disease control has increased to 74 per cent for 1929 as compared with 47 in 1927.

Racine has completed its fourth annual campaign for diphtheria eradication. In 1924 there were 121 cases of diphtheria reported and 5 deaths while in 1929 there were but 18 cases of which only 4 occurred in the last 8 months, and there were no deaths. The Health Officer states that his credit in the *Appraisal* for this work is low because the *Appraisal* does not consider the number of children to whom toxin-antitoxin has been given but only those shown to be immune by the Schick test. This annual report also announces the construction of a new City Hall in Racine, with appropriate quarters for the Health Department which have been designed by the Health Officer himself. —*Annual Report of Racine Health Department*, W. W. Bauer, M.D.

**Epidemiological Studies in New Haven, Conn.**—Dr. Dwight M. Lewis, Director, Bureau of Communicable Diseases, Department of Health, New Haven, has very kindly submitted a

sample of the epidemiological sheet which he uses to keep daily account of the incidence of certain communicable diseases in his city. The accompanying chart and key furnishes an idea of the sheet kept by the epidemiologist. New Haven has 33 wards but in order to save space the chart has been cut so as to show but 9 wards and 11 days of the month. A table at the bottom of the sheet carries a summary for the corresponding month for a series of years giving, as indicated by the key, cases of communicable disease and deaths from certain causes as well as total deaths. There also appears the number of deaths under 1 year of age and the deaths from pneumonia (lobar- or broncho-) together with age of the deceased. This work-sheet gives a very comprehensive picture of the current condition of the city's health.

## EPIDEMIOLOGICAL SHEET

FEB. 1930	WARD									HOSPITAL
	1	2	3	4	5	6	7	8	9	
1					25	10		+		25 10 1st
2										
3			10							10 1st
4					10		+			10 1st
5						+				
6				10	10	10		10		10 1st 10 1st 10 1st
7			10							
8						10				10 1st
9	10					+				
10						+				10 1st
11			10		+	10	10	+		

	K.L.	ME.	Sc.Fv.	WC.	G.M.E.	T.F.	TOTAL	< 1
1925	3-0	51-0	113-2	16-0	77-0	2-0	189	18
1926	4-1	131-0	61-1	45-1	15-0	1-1	184	15
1927	1-0	1-0	16-0	5-0	5-0	1-0	164	17
1928	4-1	743-3	13-0	109-0	0-0	2-0	205	12
1929	4-0	15-0	13-0	14-1	187-0	0-0	210	18

KEY		KEY	
● DIPHTHERIA		+	DIPHTHERIA CARRIER
○ SCARLET FEVER		✓	TYPHOID FEVER
○ DEATH	○ LOBAR PNEUMONIA	○	BRONCHO-PNEUMONIA
< 1 UNDER AGE 1		⊠	EP. MENINGITIS
○ MEASLES		⊠	POLIOMYELITIS
N/O NON-RESIDENT DEATH		□	EP. ENCEPHALITIS
NAME OF TOWN-NORTH HAVEN			

## LABORATORY

C. C. YOUNG

## AN IMPROVED TECHNIC IN BURRI'S METHOD OF ISOLATING OBLIGATELY ANAEROBIC BACTERIA

IVAN C. HALL, PH. D.

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IN 1902, Burri<sup>1</sup> devised the simple technic of a deep tube plugged at the lower end with a rubber stopper to facilitate the removal of a cylinder of agar containing colonies of anaerobic bacteria which he wished to isolate in pure cultures. These tubes, stated by him to be of the same dimensions usually used for bacterial cultures, were plugged with cotton at both ends for hot air sterilization; the rubber stoppers were

sterilized separately under water in a flask in the autoclave.

In making a culture, one of the cotton stoppers was removed and replaced with a rubber stopper. Three dilutions of the mixed culture in 2 per cent nutrient agar melted and cooled to 42° C. were then layered into the tube and covered with a further layer of sterile agar. After incubation the rubber stopper was removed and the agar cylinder pushed

out upon a piece of sterile filter paper, cut into thin sections 1-2 mm. thick with a flamed knife, and well separated colonies transferred as pure cultures to suitable mediums.

Burri pointed out the superiority of deep culture methods over surface methods of isolation, and more than ten years ago, after a fairly complete study of numerous devices for anaerobic culture,<sup>2</sup> I concluded that there were serious theoretical as well as practical objections to all surface methods of isolating obligate anaerobes,<sup>3</sup> which caused me to adopt the Burri technic in a slightly modified form as the method of choice for isolating anaerobic bacteria. This has recently been described in detail.<sup>4</sup>

The most suitable size of tube is about 9 mm. x 180 mm. and instead of sterilizing the rubber (or cork) stoppers separately, they have been placed in position before sterilization. This required autoclave sterilization in the case of rubber stoppers, but there has always been considerable trouble both with rubber and cork stoppers becoming loose, even after they were reset when the culture was poured, permitting the melted agar to leak out before it congealed. This not only necessitated repetition of the work but was highly objectionable in the consequent contamination of the containers for the tubes and the work table, often with virulent and resistant spores.

Experiments were therefore begun several months ago to find a substitute for the stoppers, using first gelatin films hardened in formaldehyde, and later collodion films which it was thought might be stripped off when the cylinders were ready to be pushed out; but the gelatin films were an utter failure and the collodion films were clearly inferior to the stoppers.

Later, Capes-Viscose caps, now manufactured by the Dupont Cellophane Company, were tried. These caps are

sold in cans containing a weak solution of formaldehyde; they are therefore sterile. When placed over the end of a tube they contract on drying to form a tight fit. Unless they are soaked for a while in a glycerine solution, they become too dry in the arid climate of Denver and often crack. We experimented with various concentrations of glycerine and found that 5 per cent glycerine solution, sterilized in the autoclave, gave the best results; higher concentrations caused the caps to wrinkle. Burri tubes capped in this manner could be sterilized either in the hot air sterilizer (70° C. for one hour) or the autoclave (20 lbs. for 30 min.) but there was considerable cracking of the caps afterward, especially when they were sterilized in the hot air. They were scarcely satisfactory as a substitute for the stoppers; if a slight wrinkle was present the liquefied agar would run out, and the contact of the agar gel with the caps softened them and favored the growth of molds. We used them for a few weeks but only with indifferent success.

The idea then occurred to utilize the caps to hold the stoppers in and this gives us well nigh perfect performance either with rubber or cork stoppers. We prefer the latter as they are cheaper and permit dry air sterilization. The tubes are prepared by the technicians, cotton stoppered at one end, cork stoppered at the other, and sterilized. The cork stoppers are then reset, capped with moist cellophane caps that have been soaked overnight in sterile 5 per cent glycerine, and dried. Our technic differs again from that of Burri in that we do not layer different dilutions in the same tube; we prefer to tube the different dilutions separately and the sterile agar top layer seems entirely unnecessary. We also use 1 per cent agar instead of 2 per cent.

We practically never have leaks any more. No molds grow on the dry caps

and the stoppers and ends of the tubes are well protected against contaminations.

The cultures are opened by stripping the caps diagonally with a penknife and removing the stoppers by means of flamed forceps. If necessary, a little flaming of the tubes will cause the meat infusion 1 per cent agar cylinders to slide out into sterile Petri dishes and they may then be sliced or broken up

and seared with a hot spatula for the picking of selected colonies.

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## INOCULATING NEEDLES

E. G. HASTINGS

*Professor of Agricultural Bacteriology, University of Wisconsin, Madison, Wis.*

IN the February number of the JOURNAL, Dr. Mudge has described an inoculating needle which he has found to be advantageous over the glass handled needle or the devices to be obtained from various supply houses.

The needle handle used in our laboratories is made from No. 6 B. & S. gauge aluminum alloy rod, which can be purchased from the Aluminum Company of America. The rod is tempered so that it is sufficiently stiff for all bacteriological work. It can be obtained in pieces from 6' to 8' long, which can be sawed into pieces of convenient length with a hack saw. The rod supplies a perfectly straight handle.

The pieces of the rod are clamped in a vise and a groove sawed at a sharp angle to the axis of the rod. The depth of the groove at the end of the rod would be approximately one-half its diameter and would extend back on the shaft of the rod approximately 1".

Platinum iridium wire can then be placed in the groove, which is closed by gently tapping with a hammer. For student work, nichrome wire of No. 24 gauge is used in place of platinum iridium. The stiffness of nichrome wire is sufficient that a much smaller gauge can be used than is possible with the platinum iridium wire, the only disadvantage being that it heats and cools somewhat more slowly than the platinum wire. For continuous work the metal handle becomes uncomfortably hot.

A glass mantle for the lower handle can be made from ordinary glass tubing of approximately the same internal diameter as the diameter of the rod. The glass is closed at one end by fusing. A little sealing wax is placed in the tube, melted, and the aluminum rod inserted into the melted sealing wax, thus preventing the rod from dropping out of the glass.

# VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

**Influence of Nonresident Deaths on Boston's Death Rate**—The large number of nonresident deaths in Boston, 2,187, a total greater than that of any other American city having a population of more than 300,000, causes Boston's statistics to suffer by comparison with those of other cities. When it is considered that practically 19 per cent of the total deaths in Boston for the year 1928 were those of nonresidents, and that of these 91.5 per cent were deaths in hospitals, the importance of these deaths becomes apparent in the rate. The outstanding reductions are found in anterior poliomyelitis, which showed a rate of 1.75 per 100,000 against 0.50 when nonresidents were deducted; scarlet fever 3.88 against 1.88; diphtheria 7.88 against 4.13; cancer 153.52 against 115.74; and heart disease 306.43 against 277.15. Other diseases showing reductions in rate when our nonresident deaths were deducted are broncho-pneumonia, diarrhea and enteritis under 2 years, congenital malformations and accidents.

A striking feature is exhibited in a comparison of Boston's nonresident deaths with those of New York City. With a population more than seven and one-half times as great as Boston, New York City had only 2,050 nonresident deaths during 1928, or 2.6 per cent of the total deaths for the year. Boston had 2,187 nonresident deaths, or 18.9 per cent of the total deaths for the year. Comparing nonresident infant deaths, New York City had 144, or 0.18 per cent, while Boston had 362, or 3.1 per cent of the total from all causes. In cities with a population of less than 300,000 where information is available,

Hartford, Conn., Salt Lake City, Utah, and Albany, N. Y., had higher percentages of nonresident deaths than Boston, the figures for the year 1928 being 28.3 per cent of the total deaths for Hartford; 23.3 per cent for Salt Lake City; and 21.2 per cent for Albany.—*Boston Month. Health Bull.*, 19: 9-11 (Jan.), 1930.

**Maternal Mortality**—The Royal Free Hospital has published a report on maternal mortality and an analysis of causes of death. About 90 per cent of patients were booked for admission from antenatal clinics, and at the most about 10 per cent were sent in as emergency cases. All cases of puerperal sepsis were completely isolated from the main block of wards. The report was based on maternal deaths which occurred during the 8-year period 1921 to 1929, and included both in-patients and district patients. The total number of antenatal attendances during this period was 49,047. Among cases in the hospital, there were 77 cases of placenta praevia, 21 cases of eclampsia, 10 cases of craniotomy, 476 cases of forceps, giving 5 per cent of all deliveries, and 152 cases of cesarean section, or 1.6 per cent of all deliveries.

There were 26 maternal deaths, corresponding to a mortality rate of 2.8 per 1,000 live births. The number of infants born alive was 9,152; neonatal deaths, 145; total number of stillbirths, 366, of which 199 were at term and 167 premature. Six deaths were attributed to obstetrical shock, 4 to shock from hemorrhage, 6 to sepsis, 2 to embolus, 4 to toxemia and eclampsia, 1 each to broncho-pneumonia and acute appendi-

citis. An equal number of deaths occurred among primiparae and multiparae. The primiparae preponderated only in the toxemia group. The cases of puerperal sepsis showed that operative interference and complications at labor increased the risk of sepsis to a great extent. Most cases of toxemia had some dental sepsis. Extraction and dental treatment were carried out in over 70 per cent of the patients treated in the antenatal clinics.—L. McIlroy and B. Turner, *Lancet*, 1: 97-99 (Jan. 11), 1930.

### Age Distribution of Influenza Deaths in Cleveland, O., 1918-1929

—The marked differences which exist in the distribution of deaths registered as "influenza" by age, sex and color in pandemic and interepidemic years warranted the belief that there were fundamental differences in the etiology of the respiratory infections listed under that title. During the influenza epidemic of 1918, it was generally believed in Cleveland and elsewhere that the population groups hardest hit were those of middle life.

A study of mortality rates of influenza and pneumonia for the months of increased incidence from the pandemic in 1918 to the subsidence in 1928 was undertaken. The data were compiled from the records of the Division of Health of Cleveland. The curve for 1918 showed high mortality rates in middle life, which is characteristic of pandemic influenza. The striking difference between this and the curve for influenza of the years since 1918 was an almost certain indication that there was a difference in etiology. The pneumonia curve of 1918 with respect to the rates in advanced life corresponded to the normal pneumonia curve and to that of influenza in non-pandemic years but differed from these by a rise in the rates for the middle decades of life. The influenza curve of 1920 was very similar

to the pneumonia curve of 1918; however, this probably included both the influenza of non-pandemic years and true pandemic influenza. The distribution of deaths by age in the normal pneumonia year and in the influenza epidemic not of pandemic type was practically identical.

Comparing the Cleveland data for 1918 and subsequent years with those of the registration area from 1890 to 1918, there was complete agreement in age distribution and sex. As to the latter, 54 per cent of the total deaths during the 1918 epidemic were male deaths while in the so-called influenza of succeeding years 48 per cent were male deaths.

The estimate of Cleveland's colored population was too uncertain to warrant any comparison of white and colored deaths.—G. W. Moorehouse, *Am. J. Hyg.*, 1: 196-201 (Jan.), 1930.

**The Problem of Diabetic Mortality**—Within the past 15 years, the position of the diabetic patient has undergone a remarkable change. The dietetic treatment of the disease has been completely altered. Since 1922, insulin has been recognized as an essential method of treatment. With the use of this valuable therapeutic measure, a decrease in diabetic mortality was expected. But there has been slight alteration in the diabetes death rate within the past 6 years. Elliot Joslin was one of the first to recognize this as early as 1925.

An analysis was made of the diabetes mortality in the State of Victoria before the introduction of insulin and for subsequent years. Since the introduction of insulin therapy there has been a definite decrease in deaths in younger people up to age 45. This is not surprising because complications which play an important part in older patients are rare before the age of 40 and by control of the diabetic condition these younger people are allowed to live for many

years in comparative safety. There has been a distinct increase in diabetic mortality in the higher age groups. The increased mortality over age 50 has occurred largely among females. This has been noticed also in the United States and England but may be due to the disproportion in sex distribution accentuated as a result of the late war. The peak of the mortality curve has shifted from age 65 to 70. The average expectation of life has been increasing but not to an extent sufficient to explain such a marked shift.

There is definite evidence particularly in the statistics of other countries that diabetes waxes and wanes with the circumstances of the people. It is therefore conceivable that alterations in the habits of life of the people and the over-taxing of the parts of the body engaged in carbohydrate metabolism may be responsible in part for the increase in deaths which are classed as diabetic.

Another analysis was made of the diabetic mortality statistics in Alfred Hospital for the 4 years immediately prior to the use of insulin and for the 6 subsequent years. There has been a marked decrease in the deaths from uncomplicated diabetes but no change in complicated cases. The average age at death of the uncomplicated cases is 37 years while that for the complicated cases is 57 years.—Ewen Downie, *Victoria, Australia Quarterly Health Bull.*, 623: 629 (July-Sept.), 1929.

**Prevention and Treatment of Pneumonia**—The effect of concentrated serum on the death rate from pneumococcus pneumonia was shown in a summary of 885 cases observed in Bellevue Hospital. Altogether, 441 patients with pneumococcus pneumonia were included in the serum treated group. The most striking results were obtained in the pneumococcus Type I series. In 153 treated cases, the death rate was 20.6 per cent while the control

series of 147 cases showed a mortality of 32.6 per cent. For Type II, the mortality was 41.5 per cent for treated and 54.5 per cent for untreated. Serum did not have any effect in pneumococcus Type III cases, the death rate being actually higher for treated cases, 40.0 per cent as against 28.6 per cent for untreated. In the miscellaneous group IV cases, serum seemed to have a beneficial effect; however, factors other than serum may have modified the death rate from lobar pneumonia.

The death rate for the entire group of 441 treated cases was 30 per cent against 39.2 per cent in 444 untreated cases. Mortality for both series, treated and untreated, was lower in patients under 40 years of age than for patients over that age. Relatively speaking, serum appeared to be just as effective in middle-aged and elderly patients as it was in younger patients.

Treated patients admitted during the first 3 days of the disease had a considerably lower death rate than untreated patients admitted during the same period, in fact, distinctly lower than for the entire untreated series. This was most marked in the Type I group, in which the death rate for treated patients admitted early was approximately one-third of that for the entire group of untreated Type I cases. The death rate for Type II cases admitted early was 34.6 per cent against 54.6 per cent for the entire group of untreated Type II cases. Thus, if patients with Types I and II pneumonia were admitted early and treated with serum, the death rate for pneumonia, Types I and II, could be cut respectively to one-third and one-half the present figures.—R. L. Cecil, *New York State J. Med.*, 30: 210-214 (Feb. 15), 1930.

**Health of Palestine**—The Department of Health of Palestine reports a small decline in the infant mortality rate for 1928. The rate for the coun-



try as a whole is 186.34 per 1,000 and 203 per 1,000 among the Moslem population. The relatively low figure of 95.89 for the Jewish population is attributed partly to the interest in maternal and infant welfare and partly to the fact that Jewish mothers are comparatively young and healthy. The total birth rate of 53.98 compares with 50.35 in 1927, and the Moslem birth rate has risen to 60.99. The number of admissions to hospitals and attendance at dispensaries continues to be high. In general, services to pregnant women, infants and children among the Arab population are inadequate.

The department records with satisfaction that the standard of school medical service throughout the country has been well maintained. The health of the children both in Arab and Jewish schools is remarkably good, while the training in hygiene and the elements of mental science is having a beneficial influence on the pupils.—*Brit. M. J.*, 1: 81 (Jan.), 1930.

**Public Health in Kenya**—A 1928 health report for the Colony and Protectorate of Kenya stated that the most outstanding feature of the year in regard to incidence of communicable diseases was a number of severe outbreaks of malaria in the highlands. For a time, the situation was undoubtedly serious. No other unusual incidence of

communicable disease occurred during 1928 and it cannot be said that the general health of the Colony as a whole was less satisfactory than in previous years. Because of inaccurate vital statistics, any variations in health standards cannot be measured. However, work was begun in 1928 which will show its results later. This work was undertaken chiefly in connection with ankylostomiasis control in the Diga Reserve on the coast.

Findings to date showed the standard of health of Africans to be generally at a low level and the physique and capacity of the population to be affected as a result of infection with endemic preventable diseases. The incidence of plague was not notable. Five cases of smallpox were reported but the source of infection was not traced. Of acute fevers, pneumonia caused much sickness and was responsible for a high mortality. In native reserves, yaws caused much disability, 85,617 cases being treated during 1928. Syphilis presented a problem of some magnitude in certain areas. Increased efforts were made to induce patients to attend regularly for treatment.

Medical work in the Colony was carried out on normal lines. Particular attention was devoted to helminthic diseases and treatment of syphilis in native reserves and to malaria control in towns.—*Lancet*, 1: 113 (Jan. 11), 1930.

# PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

## A TYPHOID FEVER EPIDEMIC IN THE FAR NORTH

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AN epidemic of typhoid fever broke out at Mile 327 on the Hudson Bay Railway in Northern Manitoba, Canada, during the late winter and early spring of 1929. This epidemic included some 57 cases and about 8 deaths. A strict system of inoculation of all persons living in the area was enforced by the medical officers so that the epidemic was held in check and finally came under complete control by June, at which time the ice finally moved out of the lakes and rivers and summer conditions prevailed.

Mile 327 or Gillam is a diversion point on this railway, the water supply for which comes from a river not a mile away from the railway tracks through a system originally intended to supply the railway with water for its locomotives and general use.

A description of the location may assist this explanation. The railway, known as the Hudson Bay Railroad, has been under construction for some time. It runs from the Pas on the Saskatchewan River in Northern Manitoba, Canada, to Churchill, a port at tidewater on Hudson Bay, also in the province of Manitoba, about 59° north latitude. The distance between these two places is 511 miles. The country through which the road passes varies. The first few hundred miles is park country but the last section nearer the salt water goes through a muskeg, with only small timber growth parallel to the bay itself.

During construction many temporary arrangements were made to use the existing water supplies all along the line. In the case of Gillam, 327 miles away from the Pas, the water service originally installed to care for the locomotives and divisional shops only had as a source the little Nelson River.

This system consists of a pumping plant housed near the water's edge and equipped with a 30 H.P. Ruston-Hornsby fuel oil engine and a triplex pump, which takes water from a cylindrical deep well placed between the pump house and the river. There is but one pipe line from the pump to the standpipe and general outlet at the railway tracks. At this point, there is an elbow in the river which makes a sweep of about half a mile around to a point lower down where the outfall from the septic tank is located.

This outbreak appears to have been due to the fact that during the very cold winter weather the river was frozen solid below the outfall of the sewer, thus forming an ice dam in the river bed and gradually forcing pollution back up the stream and past the waterworks intake. The Resident Engineer had levels run following the freeze-up and found that there was no fall in the river, but that the water surface was level.

The original plan for this pumping plant was to supply engine water at the roundhouse only. Hence, when its use, unchlorinated, for drinking and culinary purposes became common, the

contamination immediately became apparent. There is a pedestal type of chlorinator in the pump house now which is in constant use.

The Department of National Health was called upon to check up on this outbreak and its representative arrived early in June. Several drastic improvements were recommended; as, for instance, the discontinuance of the practice in vogue at many of the pump houses on this line of returning waste water to the deep well.

**The Munich Sewage Treatment Plant**—The author describes some novelties in design and operation of the Munich sewage treatment plant, which is planned for a flow of 3.6 cu. m. per sec. The special features of the plant are:

1. Its use of large single units, which have proved to be more economical than a multiplication of small plants. Three years' experience has shown no ground water difficulties to be caused by the exceptional depth of the combined settling and septic tank.

2. The use of the rock of the district for most of the building, with reinforced concrete only for supporting parts, thin walls, and service bridges.

3. The special sloping angle of the tank walls, which has proved advantageous for sludge digestion as the sludge is deposited in the septic chamber in thin, even layers.

4. Underground drainage supplied with pump shafts so that tanks can be emptied without danger of floating.

5. The sewage is distributed by divided channels and unequal division of the sludge is remedied by screens in the main channel which break up accumulations.

6. The sludge is deposited on fields in summer as dry, and in winter as wet sludge. One-third of the available ground is covered yearly, and it is found that the process can be repeated after 3

years without harm as the sludge is practically consumed in that time. In discussing the utilization of the sludge as fertilizer, the author gives comparative analyses of Munich sludge, stable manure, and the dry Baltimore fertilizer, and an account of the most suitable crops and the methods and times of applying the sludge for different crops.

7. The plant is planned for simple and hygienic service. The amount of attention required by the different parts is described. No trouble is experienced with gas or sludge rising into the settling tank. The dredger which removes the dried sludge from the drying bed leaves a very thin layer of sludge on the sand. This prevents sand being deposited on the fields and also does away with the necessity for frequent renewal of the sand surface. The yearly service cost of the whole plant is about 0.13 RM. per head of the population.

8. Increase of income. This can only be done by the gas production. Experiments showed that gas production varied with temperature, that a completely de-gasified sludge dried badly, and that digestion was better in tanks covered for gas production than in uncovered tanks. The amount of organic matter per head of the population and the amount of gas per liter of organic matter were calculated and the results tested by laboratory experiment, which showed that 20.6 liters of gas per head per day could be obtained by complete digestion at a temperature of 26° C.

The part played by the floating layer of scum in the septic chamber is then discussed. At Munich this had to be removed after 21 years' working. The tank had to be put out of action for the purpose and gas production was low for some time after it was in action again. This was the result of the removal of an easily putrefiable layer just below the top layer of scum. A large septic chamber from which the scum

need seldom be removed is therefore an advantage. Another favorable influence on digestion is the direct current through the septic chamber. The method of calculating the amount of this current is described.

The harmlessness of the effluent is shown by the fact that even rainbow trout can live in ponds fed with it. The possibility of increasing the gas output by lengthening the period of digestion or by stirring or artificial heating is discussed.—H. Keppner, *Gesund. Ing.*, 52: 678-679, 1929. (From Papers of Water Pollution Research Board, England.)

**Innovations in the Chemical Purification of Drinking Water and Information on the Present Application of Activated Carbon and Earth**—A paper read at a meeting of the German Union of Gas and Water Experts, describing physical-chemical processes of purification, especially in connection with the supply to Magdeburg of Elbe water of very variable condition and composition. A list is given of over 50 methods of treatment on which a very large number of experiments on small and large scales were made. The Magdeburg plant for dealing with the river water is described and illustrated. The pumped river water flows through four filters at gradually decreasing speed. These are arranged in steps so that between filters the water is aerated by falling over a waterfall. Then follows sand filtration in covered primary filters, at four or five times the normal speed, and slow secondary filtration for bacterial purification. The different methods of cleaning these filters are described. Chlorine gas is added by OrNSTEIN'S process in the first pure water reservoir.

The author then deals with the experiments made to find the best means of using this plant. Chlorination of the raw water before the first filters was tried with liquid chlorine, and

with chlorine preparations such as Mianin and Duamin. This chlorination showed advantages in algae destruction, decrease of bacterial growth, and a longer filter period, but smell and taste were not removed.

Coagulants were then tested, using pulverized activated carbon as the adsorption medium. The history of the activation of carbon is given, and an account of experiments. Activated carbon, alum, and marble calcium hydroxide were added in this order before the primary filters. The adsorptive effect of the carbon was, however, impaired by the formation of a coating of aluminium hydroxide, though coagulation and physical improvement were good. The addition of activated carbon, lime and aluminium sulphate did not give good results. Alum, alone or with sulphuric acid, added either to the untreated water or before the primary filters, gave good results in iron and manganese removal, but smell and taste were not improved. Chlorination of the raw water with a subsequent addition of aluminium sulphate and lime showed that the chlorine brought into solution matter which should have been precipitated and that there was no saving of alum. It was found that there were two favorable pH points for precipitation, one from 5.2 to 5.5 and the other from 6.7 to 6.9.

More satisfactory results were obtained by treating the water before the primary filtration with filter-alum and fuller's earth, with subsequent activated carbon filtration. The final filtrate was satisfactory in freedom from color, taste, and smell; iron and manganese were absent and organic matter reduced to one-half. The application of this process to practice and the construction of an activated carbon filter plant are described. The results of the different experiments are given in tables.

In discussion, Link dealt with the present condition of the methods of

purifying surface water. Fuller's earth had not been found so satisfactory in Stuttgart. Activated carbon could be applied for the removal of excess chlorine. The process and construction of the filter required further investigation.

Adler mentioned previously used processes which corresponded to those examined by the author. The use of activated carbon was limited by its rapid saturation, and the lack of simple methods of regeneration. Its real application was as a dechlorinating medium.

Haupt confirmed that good results had been achieved at Magdeburg with fuller's earth. Settling time of sufficient length must be allowed. The purification of the water must be as complete as possible before the activated carbon filter is used to remove smell and taste.

Gruschka recommended the Adler process of superchlorination and dechlorination with activated carbon. This was satisfactory with phenol-containing waters.

Bamberg dealt with the problem of acidity in a piped supply and the difficulty of purifying Magdeburg water sufficiently for a satisfactory use of activated carbon.

The author in reply agreed that water should be well purified before the use of activated carbon, but pointed out that activated carbon was used with good effect on beet sugar factories' effluents. With the specially unfavorable and changeable Elbe water, fuller's earth, by its adsorptive capacity and specific gravity, shortened the settling time and lessened the cost of aluminium sulphate and of the carbon.

Bach emphasized the necessity of limiting the pollution in a river, so that a water suitable for drinking could be procured by treatment.—O. Koenig, *Gas- u. Wasserfach*, 72: 1065 and 1091, 1929. (From Papers of Water Pollution Research Board, England.)

**The Anthrax Danger in Lahr and Its Removal**—The problem of anthrax danger from hides and tanneries has not been satisfactorily solved. The author has investigated conditions at Lahr. The danger concerns men as well as animals and arises from the hides, not from the tanning waste water, though the latter encourages and increases it. To treat the matter at the source, infected skins should be separated. Disinfection of skins is opposed by the leather industry. The writer recommends further investigations by the State of the pickle-and-lye process and the Ascoli process. The use of solid wastes and residues as fertilizers should be forbidden, and the treatment plants kept under inspection to prevent solid matter being run off with the effluent. Inoculation of cattle, drainage of fields and improvement of cattlesheds should be attended to.—F. Uhlenhuth, *Reichsgesundsb.*, 4: 288, 1929; *Wass. u. Abwass.*, 26: 156, 1929. (From Papers of Water Pollution Research Board, England.)

**Methyl Chloride Poisoning from Domestic Refrigerators**—Toxic action of methyl chloride was first reported by Eulenberg in 1876. Pigeons were used in his experiments. Exposure to gas produced difficulty in breathing, dilation of pupils, and caused birds to stagger and fall. Removal from exposure was followed by prompt recovery.

Grabis was the first to report accidental poisoning from the gas in 1914. Roth, in 1923, reported 10 cases. Schwartz, in 1926, reported 10 cases and 1 death. In all the above cases, the gas came from ice machines. Baker, in 1927, reported 21 cases among employees in a factory manufacturing refrigerators. Since August, 1928, 29 cases in Chicago with 10 deaths have been reported.

The onset is generally marked by

progressive drowsiness, mental confusion, stupor, weakness, nausea, pain in the abdomen, and vomiting. The article gives an outline of the methods of diagnosis and treatment and also histories on 6 cases.—A. H. Kegel, W. D. McNally and A. S. Pope, *J. A. M. A.*, 93, 5: 353–358 (Aug. 3), 1929. Abstr. Paul S. Fox.

### Some Examples of Pollution of Streams by Industrial Wastes—

Some of the forms of pollution are mentioned. Literature on the subject is listed and the question of legislation discussed. The Sudbury River in Massachusetts is taken as an example of a slightly polluted stream and the Pocasset River in Rhode Island as a grossly polluted stream due to wastes from textile establishments. The seasonal changes which the waters of these streams undergo are diagrammed and discussed. Remedies are suggested.

The author's conclusion states: The subject of industrial pollution is extremely important, not only for plants but for communities using the same streams. So far the data pertaining to the problem of purification of textile wastes are extremely limited, and it is hoped that increased appropriations may be placed in the hands of state authorities. Problems involving industrial sewage should be considered from the standpoint of the stream, and not from the standpoint of the individual plant. Group treatment is extremely desirable, and the formation of conservancy districts or river boards is to be recommended. Standards are difficult to establish, but it seems that an attempt should be made to maintain the dissolved oxygen at above 30 per cent, better above 50 per cent of saturation at all times. Not all textile wastes require purification, and great savings may be made by separating in the mill

the harmless wastes from those which should be purified. In some plants these latter amount to 75 per cent of the whole volume. Many streams require plain subsidence alone; others require treatment on filters. So far, single filtration has not been always effective, due to the antiseptic character of some of the wastes to be treated, or to the kinds of substances discharged.

While subsidence followed by double filtration has produced excellent results, the process is expensive, and it is unfortunate that the activated sludge process is not applicable to a waste with suspended solids of so low a specific gravity as that in certain textile wastes.—Robert Spurr Weston, *J. Boston Soc. Civil Engs.*, 16, 6: 358–373 (June), 1929. Abstr. L. W. Van Kleeck.

How Wilmington (Del.) Has Raised the Sanitary Standards of its Nine Swimming Pools—During the 1928 season excellent results were obtained in improving the condition of Wilmington's five municipal pools and four private pools by the use of a rating scheme based entirely on the chemical and bacteriological condition of the water. This method, however, had disadvantages such as excess chlorination, in pools of inferior construction, in an effort to secure a high weekly rating. As a result in 1929 the Board of Health adopted a score sheet based on the following items: equipment 100, management 200, water in pool 200.

Each section is subdivided and a perfect percentage allotted to the various items. The total score is divided by 5, giving 100 for a perfect score. It is claimed by the author that the system has been very successful in raising the swimming pool standard in Wilmington.—Russell T. Des Jardins, *Am. City*, 41, 2: 154–155 (Aug.), 1929. Abstr. J. B. Harrington.

# INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

**The Present Status of Industrial Medicine**—The highest estate yet reached by industrial medicine was attained during 1917–1919. At this time (1929) stratification has occurred so that there are recognizable two large fields of related endeavors, “industrial hygiene” and “case handling industrial medicine.” The prime activity of the first of these has been numerous special investigations related to hazards, research, and constructive work in which unfortunately participation by organized medicine has frequently been missing so that at the present time there is a definite drift on the part of the industrial hygienist away from organized medicine, where he rightfully belongs. A lower non-medical stratum, not praiseworthy, has appeared, as exemplified by the optometrists who make extensive industrial surveys seeking patronage from the visually deficient. In an instance under the author’s observation, among 396 clerks wearing glasses, 60 per cent either obtained no visual betterment or vision did not reach 20/30.

“Case handling industrial medicine” embraces primarily routine care of the injured, minor physical relief, and physical examinations. Within this division there is much stratification, most of which is not industrial medicine or at least not good industrial medicine. There are recognized the following subdivisions:

The physician with a practice that includes industrial cases

The petty industrial emergency hospital, usually looking to the compensation boards for payment for services and doing capable

and often profitable work but seldom anything constructive within the factory

Dubious gratuitous services, hoping to profit through an increase in private work

Part-time medical services for small plants, a most important demand since 99 per cent of all plants are really small ones, i.e., employing less than 500, while in fact 49 per cent employ less than 6. (Often these efforts give praiseworthy service but practically may not function to the advantage of anyone since low salaries are paid, physicians are often not qualified, and a routine of minor emergency work is performed, as for example when a plant, perhaps even with 1,000 employees, seeks to meet its medical obligation through the services of a physician 1 hour daily.)

Full-time medical services with untrained personnel

Similar services with trained personnel which may or may not be permitted to practice real industrial medicine

Medical departments maintained by labor organizations such as painters’ unions—often a commendable endeavor though not industrial medicine

Medical service extended to entire families which is really community medicine

The objectives and standards of good industrial medicine, and the qualifications of physicians to perform the same, are next discussed in detail with an emphasis upon the fact that this is a specialty in medicine and that real industrial physicians are specialists and therefore need the offered extra form of university training and much experience. The few persons trained by institutions have readily found employment since industrial managers are recognizing the advantages of such training. There are listed 11 professional or official organizations and types of institutions now promoting industrial hygiene, and 13 administrative groups (not including health

departments) which are interested in the subject.

A "synthetic" manufacturer and a "synthetic" workman each give their respective views supporting the demand for industrial medicine (a very interesting summary).

Unfortunately, medical organization at present is so much in dread of "state medicine" that all extensions of industrial medicine, as, for example, to increase the lists of recognized occupational diseases, are opposed. This very lack of flexibility on the part of the medical profession may prove to be an outstanding factor in forcing on socialized medicine.

Let it be said that unlimited coverage for proved, characteristic, occupational diseases is coming. Its embracement may be expected by several additional states within the next six years. . . . Moreover, the medical profession should not lend itself to the jokers introduced into legislature to give the appearance of the extension of compensation coverages in lieu of embracing items of real significance.

In the entire field of industrial compensation there are outstanding drawbacks of special concern to the medical profession, e.g., there are few compensation boards with competent medical advisers, and claims are being settled by non-medical officials, grossly incompetent to pass on medical matters. Here, an alert medical profession may go far in the eradication of such sources of medical malactivity.

The author next lists 10 types of objectionable features of industrial medicine when conducted under undesirable conditions and 12 precepts which comprise a suggested attitude for organized medicine toward industrial medicine. (Five pages of discussion follow. The paper was read at the Annual Conference of Secretaries of Constituent State Medical Associations, held at Chicago, Nov. 15-16, 1929.)—Carey P. McCord, *A. M. A. Bull.*, 25, 1: 11-21 (Jan.), 1930.

**Will the Inhalation of Siliceous Dusts Activate a Partially Healed Focus of Tuberculous Infection?—**Experiments were made with 95 guinea pigs which were infected by inhalation with a low virulent strain of tubercle bacillus. Groups of animals were then exposed to inhalations of quartz, granite, or carborundum dusts for periods varying from 54 to 206 days. The concentrations of the dust in the chambers ranged from 640 million particles to 957 million particles per cu. ft. of air. Death of the animals generally occurred between 200 and 400 days after commencing the exposure but 2 of the carborundum animals survived to be killed on the 1,385th day.

The virulence of the tubercle bacillus used has been studied for about 12 years at the Saranac Laboratory. Quartz and carborundum dust have regularly caused the tubercular infection to become progressive in each animal exposed. Granite was much less active and no alteration was observed with marble dust or bituminous coal dust. In fact, the latter seemed to accelerate healing. Asbestos dust exerted a stimulating effect only in an occasional animal.

Quartz, granite, and carborundum dusts may reactivate and cause tubercles to spread which are as old as 200-400 days.

There was noted a high incidence of complicating pneumonia particularly in the granite group, which was caused by the Friedlander bacillus.

The character of the lesions produced by reactivation both in the undusted control animals and in those exposed to a prolonged inhalation of dust is described. Carborundum, which is the carbide of silicon, and which theoretically contains very little crystalline silica, is very active (in breaking down the tubercles). Apparently, quartz reaches the interior of the tubercle in



greatest quantity; next comes carborundum and the least amounts are granite dust.

The experiments have proved that in the guinea pig it is possible to light up a quiescent focus of tuberculosis and to render it progressive. However, this does not necessarily indicate that the same thing occurs in the human being, but the truth can be learned by careful clinical radiographic and post-mortem observations.—Leroy U. Gardner, Saranac Laboratory, *Pub. Health Rep.*, 45, 6: 282-288 (Feb. 7), 1930.

**A New Journal in the Field**—The *Archiv für Gewerbepathologie und Gewerbehygiene* appears for 1930, the first two monthly issues in a single volume, the publisher being Julius Springer, Berlin. The *Journal* is under the coöperative effort of the following: Charles Badham, Sidney; L. Carozzi, Geneva; B. Chajes, Berlin; L. Devoto, Milan; Cecil K. Drinker, Boston; H. Engel, Berlin; F. Flury, Würzburg; H. Fühner, Bonn; D. Glibert, Brussels; Leonard Greenburg, New Haven; M. Hahn, Berlin; K. Hamel, Berlin; Alice Hamilton, Boston; E. R. Hayhurst, Columbus; T. C. Houghten, Pittsburgh; M. Kaplun, Moscow; R. Kockel, Leipzig; F. Koelsch, Munich; Thomas Oliver, Newcastle Upon Tyne; D. Pometta, Lucerne; R. R. Sayers, Washington; M. Sternberg, Vienna; H. M. Vernon, Oxford; and C.-E. A. Winslow, New Haven, and under the editorship of Dr. L. Teleky, Düsseldorf, and Professor H. Zangger, Zürich.

The articles in the first volume include the following:

Introduction, Dr. H. Zangger, pp. 1-51 (in German)

Reflections on Certain Problems of Industrial Medicine, Prof. Dr. Luigi Carozzi, pp. 52-66 (in English)

Pulmonary Asbestosis, A Socio-medical Study, Sir Thomas Oliver, pp. 67-76 (in English)

Concerning Modern Organic Solvents, Heinrich Zangger, pp. 77-196 (in German)

Observations upon Arsenic Poisoning, Dr. Winfried Grassmann, pp. 197-202 (in German)

Climate and Work, Dr. Walter Strauss, pp. 203-239 (in German)

A Report upon the Question of Occupational Myopia, Dr. L. Teleky and Dr. Adolf Thier, pp. 240-270 (in German)

The Differential Diagnosis of Silicosis by X-ray Pictures and an Investigation of the Hazards in Sandblasters, Dr. Lochtkemper, with 18 illustrations, pp. 271-302 (in German)

The set-up of the *Journal* shows extreme care; the type is very legible; and the paper of fine quality, which carries the various illustrations and tables well. The price is 38.60 marks.—Julius Springer, Publisher, Berlin, W 9, Linkstr. 23/24.

**Industry in Relation to Personal and Public Health**—This is a very interesting historical discussion of the irregular improvement of the health of workers from prehistoric to present times. Probably silicosis is the oldest occupational disease, as it may be imagined to have existed among the flint implement makers in the prehistoric factories, such as those found at Grime's Graves near Brandon in Suffolk. Arguments are adduced to show that the great empires of the world have fallen one after the other, through the introduction of slave labor with the failure to protect the health of those employed.

It is recognized that industry is the instrument for preserving the health of nations. "In the sweat of thy face shalt thou eat bread" was in very truth a blessing and not a curse hurled at Adam. Intelligence cannot create industry without industry reacting and stimulating intelligence. Indeed industry may fairly be said to be the instrument used by nature for developing intelligence and preserving health.

The influences of climate, the introduction of water power, wind power, and of steam are reviewed, the latter in par-

ticular having at first led to the misuse of workers, but now labor saving devices are steadily eliminating poorly paid manual effort, while complicated processes are ever more and more being introduced into industry which call for specially skilled operatives. The future of the human race cannot be foreseen, but it will be determined by man's intelligence acting through his industries, until barren places of the earth are made fertile and come to support populations, kept healthy by physical and mental activities developed in the pursuit of well ordered industry.—E. L. Collis, *J. State Med.*, 37, 3: 125-137 (Mar.), 1930.

**Some Facts about Pennsylvania Women Wage Earners**—In a series of charts based on figures of the 1920 United States Census, with accompanying tables applying to the nearly three-quarters of a million women who are gainfully employed, or 1 out of every 5 women in the state, the Pennsylvania Bureau of Women and Children finds in brief as follows:

1. One-fifth of the employes of the state are women.
2. The percentage of women employed has increased from 10 in 1870 to 21 in 1920.
3. The percentage by occupations in 1920 was: domestic and personal service, 25; clerical occupations, 18; "other manufacturing occupations," 15; textiles, 12; professional service, 11; trade, 10; "other non-manufacturing occupations," 4; clothing, 4; and food, 1.
4. In seven cities, all located in the eastern half of the state, more than one-fourth of the women are gainfully employed.
5. Nearly one-half of the women employed are under 25 years of age, while less than one-fourth of the men are under 25 years of age.
6. Among women gainfully employed, 88 per cent are native born and 12 per cent foreign born.
7. Native born women of foreign or mixed parentage are more likely to be gainfully employed than either foreign born women or native women of native parentage.
8. Less than one-fifth of the gainfully employed women are married.
9. Practically one-half of the single, wid-

owed, and divorced women are gainfully employed; less than one-tenth of all married women are employed outside their homes.

10. Married women are more generally employed in domestic and personal service than in any other important occupational division. The highest proportion of single, widowed, and divorced women are employed in clerical occupations.

11. Only in domestic and personal service are more women employed than men. In manufacturing and mechanical industries in which one-third of the women of the state are employed, 16 per cent of the workers are women.

12. Next to household servants, the greatest number of Pennsylvania women are employed as textile operatives.

—Bureau of Women and Children, Dept. Labor & Industry, Commonwealth of Pennsylvania, Harrisburg, 1930, 23 pp.

**Women in Trade Unions**—A summary of a study of the German General Federation of Trade Unions emphasizes the increasing number of women workers in industry. In typical trades they have the following percentages according to the annual reports of the unions for 1928: tobacco workers 77.5; bookbinders 67.9; printers 64.1; hatters 63.3; textile workers 57.8; clothing workers 48.1; and shoemakers 44.3.

The percentage of women is likewise increasing in those unions in which their number is usually small, e.g., in the metal industry from 11.1 per cent in 1925 to 15.2 per cent in 1928, etc.

The unions provide a program of education for new workers, while the women are taking an important part in works councils. Owing to the continual influx of women in industry the wages of women workers are much lower than those of men, but considerable progress has been made in raising them.

In regard to maternity protection it is found that women are making increasing use of the right to leave work 6 weeks before confinement, but when engaged on piece work they are much less

willing to do so. However, under the decree of May 18, 1929, by which the allowance for the 4 weeks preceding confinement is increased to the equivalent of three-quarters of the basic wage, this condition is being bettered. There is often difficulty in carrying out the provisions relating to the 2 half-hour intervals for the nursing children. In some shoe factories the women have refused to take their infants to the nurseries provided because their clothing is saturated with chemicals. The Saxon Government has made extra monetary inducements to every pregnant woman to leave her work for 8 weeks preceding confinement.—*Indust. & Labour Inf.*, XXXIII, 7: 220-222 (Feb. 17), 1930.

**Sugar**—The per capita consumption of sugar in the United States in 1925 was 107 lb., compared with 8.8 lb. in the year 1823. The derivation of the sugar used in the United States according to Senate discussions shows as follows (percentages): Cuba (cane) 58.3; United States (beet) 15.39; Hawaii (cane) 10.89; Porto Rico (cane) 8.10; Philippines (cane) 5.51; and Louisiana and Texas (cane) 1.24. In 1929 it was estimated that 1,250,000 short tons of beet sugar were produced in the United States. Very little of the imported sugar is refined as received, so that it has to be re-melted and refined after reaching the country.

There are, then, in the United States 103 beet sugar factories, operating in 18 states, but especially concentrated in Colorado, Utah, Michigan, California and Idaho. There are also 60 "sugar-houses" in Louisiana and eastern Texas, grinding sugar cane but not producing the refined article, and 21 great sugar refineries located mostly at seaport cities. According to the Census of Manufactures for 1927, 79 beet sugar factories employed 8,872 workers, 53 cane sugar factories (not refining) 1,225

workers, while 21 cane sugar refineries had 15,742 employees. (The paper then takes up a detailed discussion of manufacturing processes with resulting health hazards, giving a classification of jobs for (1) Beet Sugar, (2) Sugar-houses and (3) Sugar Refineries.)

Potential health hazards of the industry are discussed by Dr. Carey P. McCord with particular attention to sugar as a specific hazard in reference to "sugar dermatitis," the "sugar mite," explosions, and miscellaneous chemical hazards (carbon monoxide, sulphur dioxide, lime, chlorine, carbon dioxide, ammonia and ammonia cyanide, alcohol fumes, inorganic dusts such as charcoal, sulphureted hydrogen and mineral acids), and mechanical hazards.

In a general estimation of the situation, "it is maintained that this industry affords considerable opportunity for occupational impairment of the health of exposed workers." While few specific occupational diseases occur, ill-defined impairments and early degenerative diseases are the ones most inimical to health and such are especially associated with the high temperatures, wetness, and high humidity.—*Industry Report*, Retail Credit Company, Atlanta, Ga., V, 2: 13-24 (Feb.), 1930.

**Composition Roofing**—This treats of the manufacture of asphalt and asbestos roofing but does not cover such products as wood shingles, tile and metal roofing of various types. There is the usual job classification in which the hazards of each are discussed as well as the commoner occupational diseases which are specified as follows, at least potentially: asbestosis, silicosis, tar poisoning, tar dermatitis, poisoning from "cutting back" solvents, carcinogenetic action of roofing materials, and various other effects of toxic and miscellaneous hazards.—*Indust. Rep.*, 5, 3 (Mar.), 1930. Retail Credit Co., Atlanta, Ga.

# FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Cereals and Rickets. III. The Comparative Rickets-Producing Properties of Corn, Wheat, and Oats, and the Effect of Irradiation and Mineral Supplements—This records an extensive series of experiments on use of activated cereals on rats begun in 1924 and in which a total of 230 rats were employed. Preliminary experiments indicated that untreated cereals were definitely rachitic and at this time a report of an investigation was received stating that cereals do not produce rickets in proportion to their calcium and phosphorus deficiency, and further that oatmeal was the most rachitic and white flour the least, contrary to the evidence found in the preliminary experiments. In these experiments in 1924, young rats were getting an experimental ration of a single cereal for 5 weeks; the rats were then killed and the femurs analyzed. The percentage of ash in the femurs was highest for wheat and lowest for corn meal, rolled oats being intermediate. The experiment definitely indicated that all cereals were ricket producing.

In 1925, experiments were conducted to compare corn, wheat, and oats. The cereals for controls were irradiated in thin layers for 30 minutes by a quartz mercury vapor lamp. In this experiment, the growth on non-irradiated cereals was practically the same, while on the irradiated ration the wheat was superior. Yellow corn was the least favorable. In both these experiments, calcium carbonate at 3 per cent level was included in the feed.

In 1925 and 1926, corn, wheat, and oats, both irradiated and non-irradiated,

were fed with 0, 1, 2, and 3 per cent calcium carbonate addition. In this experiment some rats were fed a ration in which the phosphorus intake was equalized by the addition of  $H_3PO_4$ . In this experiment vitamin A deficiency was manifested. In spite of this, good rate of growth and maintenance prevailed through the 5-week period. Growth on rolled oats was less than on wheat and corn in which the poor consumption of this cereal was a factor. Calcium deficiency of the cereals was evident since when  $CaCO_3$  was added up to 1 per cent, growth increased but did not increase with additional calcium. Phosphorus addition made no material change. Wheat was superior in bone production followed by rolled oats and yellow corn in the same relation with the ash in the femurs.

In the experiments in 1926 and 1927, an attempt was made to measure carefully the rations consumed by limiting the intake to that which was all entirely consumed by any one individual. Corn, wheat, and oats were ground to an impalpable powder and fed with wheat gluten and sodium chloride and calcium carbonate. In the rolled oats it was found that these were not consumed readily and the uniform intake could not be insured. The wheat increases were found uniform in untreated cereals without carbonate additions. Irradiation, as in other experiments, made definite growth increases. With calcium carbonate addition there was less increase in weight on the corn diet. In general, the effect of irradiation was to equalize the calcification, but without calcium supplements the percentage of

ash was not increased. Supplementary experiments were run to account for the poor consumption of rolled oats, which seem to preclude the vitamin A deficiency and indigestibility as factors. The opinion is offered that a deficiency of vitamin G may be involved.—H. Steenbock, Archie Black, and B. H. Thomas, *J. Biol. Chem.*, 85: 585 (Jan.), 1930.

**The Effect of Vitamin D and of Reaction of Diet upon Response to Parathyroid Extract**—Recent investigators have reported the prevention or postponement of tetany by cod liver oil or irradiated ergosterol in parathyroid-ectomized dogs. Others have found that even massive doses of irradiated ergosterol afford little protection. Milk, lactose, calcium lactate, acetate, or carbonate and ammonium chloride, as well as parathyroid extract, have been found to prevent tetany in these cases. In the absence of records as to the effect of parathyroid extract on animals deprived of vitamin D this work was undertaken on young vitamin D-free dogs.

Pups 5 weeks of age were placed on a low phosphorus normal calcium diet. Two in each litter received vitamin D. All grew, but the other animals developed signs of rickets. At the fourth month parathyroid injections were begun when definite rachitic symptoms including lowered serum calcium and phosphates were evident.

One of the dogs receiving the vitamin D complement (1 mg. irradiated ergosterol daily) succumbed to hypervitaminosis D. There was great increase in serum calcium while the corresponding vitamin D-free dog, with neutral urine, showed only slight increase in serum calcium. A dog, vitamin D-free, urine acid, showed less response, but the dog with urine alkaline, vitamin D-free, died of overdosage, indicating the alkaline reaction of the urine as contributing to

susceptibility which was confirmed by supplementary experiments.

Single doses of parathyroid extract had the same effect on young dogs which had been given vitamin D either as cod liver oil or irradiated ergosterol. With a diet producing Ca : P ratio of 1.64 with irradiated ergosterol insufficient to prevent rickets, dogs succumbed to parathyroid extract injections but on a lowered vitamin D-free diet showed no ill effects. The increased response to parathyroid administration with sodium carbonate sufficient to make the urine alkaline was observed both in young and adult dogs. The amount 0.5 gm. per kilo per day of sodium carbonate is sufficient for this purpose. With ammonium chloride substituted for sodium carbonate only slight response is noted. In view of the reports of the use of cod liver oil or ergosterol and calcium salts in the treatment of hyperparathyroidism the authors conclude that these experiments would indicate caution in such treatment.—Agnes Fay Morgan and E. Alta Garrison, *J. Biol. Chem.*, 85: 687 (Feb.), 1930.

**Irradiated Products and the Public Health**—This is a report of the recommendations adopted by the Conseil Supérieur d'hygiène publique, of which the authors are members. The report is divided into two parts—a discussion of the adverse effects encountered in the use of ultra-violet rays, and the use of irradiated food products. In the latter case, there is quite a complete summary of all of the recent work both in Europe and America on the danger of hypervitaminosis by the administration of irradiated ergosterol.

Reference is made to the warning of the Council of Pharmacy and Chemistry of the American Medical Association relative to the care which should be taken in recommending this new treatment. Reference is also made to the

reports of the toxic symptoms demonstrated by the use of irradiated foods, in particular irradiated milk.

In conclusion, in view of the diversity of the origin and preparation of irradiated products and the changes that take place on aging, it is considered indispensable that the medical profession be exactly informed on the following points: the procedure employed in obtaining the irradiated product, the antirachitic power of the drug, and finally, the date of manufacture. It is important that this information appear on the label and circular and that the date of the manufacture be printed on the case containing the boxes or bottles of irradiated products.

These irradiated preparations should only be distributed by pharmacists.—D. F. Bordas and Jules Renault, *Ann. des Falsifications et des Fraudes*, 253: 37 (Jan.), 1930.

**The Escherichia-Aerobacter Group as an Index to Proper Pasteurization**—The coli bacillus, because its thermal death-point closely approaches the pasteurization temperature, has been often used as an index to the efficiency of pasteurization. This paper reports experiments to ascertain whether or not there is a relationship between counts of *E. coli* and *E. aerogenes* and the efficiency of pasteurization. One hundred samples of milk were inoculated with pure cultures of *E. coli* and heated for 30 minutes at temperatures used in commercial pasteurization. It was found that *E. coli* survived the heating process in 32 per cent of the samples. As a result of experiments on the acclimatization of *E. coli* to higher temperatures by using resistant individuals selected on successive heatings it was possible to raise from 145° F. to 148° F. the abso-

lute death-point of a culture of *E. coli* the usual or majority death-point of which was 144° F. for 30 minutes.

It is concluded that organisms of the Escherichia-Aerobacter group may survive in milk that has been properly pasteurized and that, therefore, the coli test cannot be used as a true index to proper pasteurization.—E. Arthur Beavens, *J. Dairy Sci.*, 13: 94 (Mar.), 1930.

**An Outbreak of Food Poisoning Caused by Salmonella Enteritidis**—An outbreak of food poisoning following the ingestion of cream puffs infected with *S. enteritidis* is reported. Ninety people who were made ill displayed typical symptoms of acute gastroenteritis. The average time of appearance of the clinical symptoms was 10 hours after ingestion of the pastry. Delayed symptoms were noted in three of the cases which were mild, illness appearing 24 hours after ingestion. In one case symptoms appeared within 4 hours while in 4 other cases within 6 hours. Subnormal temperatures were noted during the acute stage of the illness followed by slight temperature later in the illness (100–101° F.). All patients recovered.

*Salmonella enteritidis* was recovered from the cream filling of the pastry; from excreta of mice in the bakery as well as from the intestinal contents of mice trapped in the bakery. Intraperitoneal injections of the recovered organism into mice and guinea pigs cause the death of the animals. Similar injections of killed cultures and culture filtrates both heated and unheated cause death to these animals. Feedings of viable and killed cultures of a number of rabbits and guinea pigs were negative.—Rigney D'Aunoy, *J. Infect. Dis.*, 45: 404 (Nov.), 1929.

# PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.\*

**The Rural Nurse as a Case Worker**—Katherine D. Hardwick, Director of Social Work, Simmons College, has written a splendid article on the pioneering jobs in social work that a rural public health nurse is called upon to do.

As a result of returns from a questionnaire sent to 63 rural nurses in New England, Miss Hardwick summarizes the situation as follows:

The rural nurse as a case worker—Fifty-three of the nurses questioned feel that they bear the brunt of the case work.

Types of problems most frequently indicated with some suggestions for case work procedure—Though the number of cases in rural districts are limited, they usually represent problems most difficult to solve and are most time consuming. The average public health nurse is seldom fully equipped to solve these problems. What shall she do?

1. Leave them alone? Impossible!

2. Form a subcommittee of her nursing committee to take charge of social problems? According to answers received this is not advisable.

3. Meet pressing needs by giving material aid—sometimes out of her own pocket—or organize a relief fund? The experienced nurse knows that relief alone is not the whole story. She must know the cause of the family's difficulty before she prescribes for it.

4. Should she then become a social case worker? Can she? Aside from lack of training, has she the time? Will she not in many instances jeopardize her influence as a public health nurse for the entire community because of the general prejudice against social investigation?

5. And lastly—does the public health nurse really want to do social case work?

Miss Hardwick feels that the public health nurse has been a trail blazer, and

social case workers owe her a debt of gratitude. Why not joint consideration of the problem? Is there no way whereby a competent case worker might help the nurse by sharing experiences and training? Miss Hardwick further suggests that perhaps a joint study committee of the two groups would add to our knowledge of rural problems and strengthen both professions.—Katherine D. Hardwick, *Trail Blazing in Social Work*, *Pub. Health Nurse*, Mar., 1930, pp. 115-121.

H. L.

**To Urban Official Public Health Nursing Agencies**—The National Organization for Public Health Nursing committee to study the usefulness, function, constitution and methods of appointment of committees on public health nursing advisory to the public authorities, is most anxious to get in touch with urban official agencies, having such a committee. If you are in an official organization which has a lay advisory committee for its nursing service, will you please notify the chairman of this study committee.—Agnes J. Martin, 419 City Hall, Syracuse, N. Y.

H. L.

**The Private Physician and the Public Health**—The Bellevue-Yorkville Health Demonstration in New York City has arranged to offer—free of charge at first—the services of a qualified public health nurse a half day a week to each of a selected group of private physicians who wish to put more emphasis in their own practice on preventive work—such as health examinations and supervision, immuniza-

\* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

tions and the like. Medical laboratory service for private physicians will be given free to patients needing it and at a moderate charge to those who can afford to pay. This experiment was suggested by Dr. Shirley Wynne (New York City Health Commissioner) as a means of furthering coöperation by private practitioners in preventive work for public health.—Preventive Private Practice, *The Midmonthly Survey*, Mar., 1930, p. 712. H. L.

**Public Health Nursing in a City Board of Health**—From the annual report of the Detroit Department of Health we get a picture of how one large city health department organizes its public health nursing division.

Although nurses are assigned to the different divisions in the department—the School Health Service, Child Welfare, Communicable Disease, Special Investigation, Social Hygiene, Health Education, and several others—the nurses, nevertheless, maintain their identity through the Division of Nursing.

Field nurses are responsible to supervisory nurses in each division; the supervisors, in turn, are guided and directed by the Superintendent of Public Health Nursing who is chief of the Division of Nursing. All rules and regulations pertaining to conduct, efficiency records, employment of new nurses, and question of education, are carried out by the division. A Nurses Council, members of which are elected from each

of the various divisions, has been particularly active in stimulating a desire for providing facilities for education and in developing the general interests of public health nursing.

The city as a whole is cared for on the specialized plan of nursing; there are, however, two districts where a generalized program is being carried on. Nurses entering the Department of Health are given public health training—as very few of them have had any previous public health experience—though no academic credit is given for this training. However, through the coöperation of the College of the City of Detroit, a chair of public health nursing has been established; and the Department of Health, when in need of new nurses, will now be able to procure nurses with some public health training. This course will also give members already in the employ of the Department of Health an opportunity to take extra courses for which they will receive academic credit.

The present population of Detroit is estimated to be 1,429,000. The Department of Health employs 348 nurses—including one superintendent, 33 supervisors, and 314 field nurses. There is a salary range for field nurses from \$2,040.00 to \$1,560.00 a year. The total cost (salaries) for 348 nurses in 1929 amounted to \$666,060.00. The nursing service cost approximately 46.6 cents per capita.—*City Health*—Bulletin Detroit Department of Health, Annual Report, Jan., 1930. H. L.



# EDUCATION AND PUBLICITY

EVART G. ROUTZAHN\*

**Health Education in Clinics—** Please tell what you do and send samples of printed matter and offer the loan of special devices. For use the morning of Monday, June 9, 1930, in the Health Division, National Conference of Social Work. Address Evart G. Routzahn, 130 East 22d St., New York, N. Y.

**Reports of Health Surveys—**An examination of several hundred survey reports—inclusive social surveys and specialized studies—shows a wide variety of cover and title page arrangement and of other "front matter." The recently published Health Inventory of New York City, the Welfare Council report, is almost ideal in this respect. The main facts as to its nature, the authors, the local sponsoring organization, the city of publication, and the scope of the study can be gathered quickly at a glance. One weakness is that the date of the study is buried near the bottom of the second page of the preface. As there stated, the data are for 1926, or for 1927 when the other were not available. But some dated 1928 material appears in the text, and a number of the tables, especially those "for one year," are not dated. Otherwise the "front matter" offers what the student and the librarian need for rapid, accurate handling of reports. In contrast many health reports offer needless problems to cataloguers and bibliographers. Particularly when surveys are made by outside agencies it is desirable

that the local distributors of the report should be identified. When, as in the case of Montreal, a special continuing group has been formed, the address of its executive center should be indicated. No local citizen, whose interest has been aroused, should be in doubt as to where to go with questions or offers of service.

**What Topic and When?—**Have you been reading in this department the collections of topics presented by radio, press releases and monthly bulletins?

Does the diversity of theme suggest questions as to where we are going and how much we are accomplishing? Are there too many topics? Do we present any one topic enough times and in enough different forms to get somewhere in the minds and habits of our constituencies? Is there team-play in any states—between the several state health groups and the different types of local health agencies? Is coöperation in making more of a few topics desirable? Is it practicable? If desirable and practicable what are we doing about it? Whose responsibility is it, anyway?

**International Health Exposition**—This department of the JOURNAL is delighted that so many public health workers will visit the International Health Exposition at Dresden, and the great permanent Social Museum at Munich.

Graphic presentation of ideas, facts and figures should be bettered amazingly as a result of those visits.

Program committees for national, state, and local groups of health and

\* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

social welfare groups are urged to give space on programs for a report on graphic presentation as it is done in Germany.

**Health Education, Etc.**—The following will be discussed in various groups during the National Conference of Social Work (Address: 277 East Long St., Columbus, O.), June 9-14, 1930, in Boston: Clinics as Centers of Health Education, The Interpretation of Social Surveys, Philosophical Basis of Social Work Publicity, How to Develop a Favorable Public Attitude toward the Trained Social Worker, How Evaluate Newspaper Publicity in Social Work? How Make Statistical Data Interesting? What Should the Publicity Worker Know about Social Work? What Constitutes a Reasonable Budget for Publicity? The Factual Basis of Social Work Publicity, Putting Over Probation—The Education of the Public, Publicity Technique Brought Up-to-Date, Putting Life into the Case Work Speech, Relations of the Chest Publicity Director to the Agencies, Raising Money by Mail, National and State-wide Distribution of News, Question and Answer Meeting, Outstanding Publicity Ideas of the Year, Motivation of Public Response to Social Information and Appeals, Division of Responsibility between Community Chests and Member Agencies in Informing the Public, Out of Focus (distorted publicity—with sound), The Year's Publicity Record (Harmon awards).

The education-publicity headquarters will be on the stage of the ballroom in the Statler Hotel.

**News Releases**—What do you think of this array of topics?

City health departments: Detroit—Early care for tuberculosis, Responsibility for the health of the school child, Scarlet fever prevention; New York—

Dr. Darlington as health commissioner, citizens as unofficial inspectors of neighborhood conditions, public health nursing, business and health, 45th anniversary of Dr. W. H. Guilfooy with city department, weekly report on city's health.

State health departments: Connecticut—Tularemia, New eating place regulations; Illinois—Vitamin D and perfect teeth, Druggists warned against prescribing remedies, Household milk pasteurizing process; Iowa—May Day, Diphtheria; Maryland—Typhoid; North Carolina—Smallpox; Virginia—Open season for flies.

U. S. Public Health Service: Dust-removal systems in granite cutting, Leprosy in the U. S., Prevention of scarlet fever, Malaria in U. S., Control in interstate spread of disease.

American Child Health Association—Clip-sheet on May Day; National Society for Prevention of Blindness—League of Nations' study of motion picture effects on children's eyes.

New Jersey Tuberculosis League: Clip-sheet—Infants protected by health campaign, Tuberculosis takes heavy toll from colored children, Suitable clothing for spring, "Broken homes" through disease, Study of child tuberculosis cases, Lack of rest, Child health spring campaign, Invalid relatives imperil childhood, Nurses in spring health campaigns.

**True vs. False Teaching**—The use of the schools by manufacturers was discussed by Dr. H. E. Barnard, director of the President's White House Conference on Child Health and Protection, before the Department of Superintendence, National Educational Association. Dr. Barnard said:

Every idea in the field of nutrition has promptly found its way into the schoolroom and carried with it fads and foolishness to command the attention of the teacher and her children until the next new thought supplanted it.

We have used the schoolrooms as a means by which the millions of dollars spent in advertising tooth paste can be translated into profits by committing every school child to the now recognized fallacy that tooth decay is definitely related to tooth paste.

If the tooth brush is used as a symbol for oral cleanliness, just as soap is now made to stand for the sanitation of the outer surfaces of the body, we should by all means continue to urge its use, but when tooth brush drills are premised upon unsound scientific data it is time for the teacher to recognize the difference between fact and propaganda.

Without doubt we have done many things that have been a little help in establishing health knowledge and health behavior. Now it is high time to find out what to do that will be of the greatest help and how to fit it intelligently into our educational system.

**Awards for Health Material at Boston**—Health agencies should be well represented in the awards to be announced in Boston, June 9–14, by the Social Work Publicity Council, 130 East 22d St., New York, N. Y. *Write for the addresses to which to mail entries in the following classes: Annual Reports, Letters, Newspaper Articles, Published Photographs, Published Statistics.*

**Dr. Biggs Believed in Health Education**—Among public health objectives as outlined by Dr. Herman M. Biggs in his last address, May 17, 1923:

Provision of systematic instruction in elementary physiology and hygiene and in health habits in the primary and secondary schools, and more extensive instruction in the normal schools and universities.

Postponement of the age at which death occurs from the cardiovascular diseases and the other diseases of later life, through physical examination and instructions as to methods for retarding or arresting their progress.

The prevention by education and law enforcement of new infections in the venereal diseases, and provision for more adequate treatment of syphilis.

The extension of the educational work of the public health authorities as a most effective means to promote the preservation of health and the prevention of disease.

#### HONORABLE MENTION

To Racine (Wis.) Board of Health: for its successful mimeographed annual report for 1929.

To the State Charities Aid Association of New York: for its 1928–1929 annual report—for its title, "A Year of Citizen Service in Health and Welfare"; the table of contents, illustrations, and general make-up.

To Welfare Council of New York City: for the cover, title-page and other "front matter" of A Health Inventory of New York City—for completeness and clarity of arrangement.

To Illinois Department of Public Health: for annual report with an index (but lacking table of contents); for numerous diagrams and statistical maps.

#### REPORTING

A Public Health Program on a Fact Basis. Cleveland (O.) Health Council, 715 Superior Ave., N.E. A 4-page folder listing "Fact Finding Studies," with the corresponding list of "Action Based on Results." *Free.*

A page statistical report in the 1929 annual report of the Infant Welfare Society, Chicago, Ill., is divided under "Infant," "Pre-School," and "Prenatal." *2 cents a copy.*

The annual report of a county nursing service in New York contains no office address, no address for securing service.

Milestones in Health and Welfare, a summary of 57 years of work by the State Charities Aid Association, 105 East 22d St., New York, N. Y. 28 pp. *Free.* Should be suggestive to a local, state or national agency in recording past activities.

Telling the Story in Graphic Form, by Charlotte Heilman. *Red Cross Courier*, Washington, D. C., March 15, 1930. Describes and illustrates 8 kinds of data a visiting nurse association may

express through diagrams—for annual report or office use. *Free.*

**Its Major Activities.** Connecticut State Dept. of Health, Hartford, 1929. 12 pp. Every bureau and division is presented in concise paragraphs as follows:

Bureau of Public Health Instruction—

Keeps the department activities to the forefront in all parts of the state and spreads health information through the following activities:

Supervision and preparation of weekly and monthly health bulletins

Placing and distributing health educational material such as moving picture films and equipment, health posters and health leaflets

Making arrangements for lectures and public health courses

Planning and installing health exhibits

Reviewing new illustrative material and new methods of presentation and recommending the purchase of new equipment or the adoption of new methods to further health educational work

Keeping in close touch with health leaders and local organizations to encourage a wider use of the department health educational service

Studying local health trends so that the health educational service may adequately meet the needs of local organizations and community groups

Assisting local groups in planning health meetings

Under the supervision of this bureau is carried on through:

Nutrition articles, leaflets, and a nutrition handbook

Lectures and nutrition courses for public health nurses and other leaders

Nutrition exhibits

Advice on nutrition problems in the field

#### CONTESTS

Listening in on the National Press Club spelling bee prompts me to offer again the suggestion that a health spelling bee contains possibilities!

The ninth annual health poster contest has been conducted by the Anti-Tuberculosis Society of Schuylkill County, Pa. Subject: Nutritious foods.

National Safety Council, Chicago, Ill., is conducting the second Inter-City

Motor Vehicle Fatality Contest. Ends August 31, 1930.

A state-wide junior high school essay contest on "Protecting Health in Youth" was a feature of the Early Diagnosis Campaign in Michigan.

The American Eugenics Society, New Haven, Conn., is conducting a competition open to clergymen of all faiths for prizes aggregating \$1,000 for sermons on "Religion and Eugenics: Does the Church have any responsibility for improving the human stock?" Closes July 30.

"Minnesota high school girls presented many different interpretations of the pamphlet "It and How," published by the Minnesota Public Health Association, as a part of its teen age campaign, in a state-wide contest just completed." Two prize essays appear in *Everybody's Health*, St Paul. March, 1930. 10 cents.

*The Journal of the Outdoor Life*, 370 7th Ave., New York, N. Y., will pay for photographs suitable for publication. To be rated for (1) subject matter, (2) composition, (3) technical excellence. \$1.00 to \$5.00 for each photograph accepted. *Why not conduct a local competition, sending the winners to the Journal?*

Subjects for Photographs—Human interest scenes showing some phase of cure-chasing. Suggestions include outdoor or indoor scenes for all seasons of the year (not buildings), children, groups of patients doing something such as occupational therapy, taking heliotherapy, walking, listening to the radio, nature study subjects of birds and flowers, or any other scenes typical of life in and about a sanatorium or elsewhere in the life of a cure-chaser. Posed groups looking at the camera have no photographic interest nor value. All photographs in which real people appear must be accompanied by written permission from each of these persons saying that he or she is willing to have the picture published, and also a statement of where the photograph was taken.

Iowa High School Public Speaking Contests. Extension Dept., University

of Iowa, Iowa City, Ia. Describes Iowa High School Debating League. When will we have a health debate contest? 10 cents.

#### RADIO

Four Heart Talks, by president of Heart Council, 312 West 9th Street, Cincinnati, O. Listeners were asked to enclose 6 cents in postage. "Nearly 500 requests from 33 states, and requests are still coming."

The "Careful Twins," "Handy Andy" and "Ready Eddy," conduct the Careful Children's Club of the St. Louis Safety Council in a nightly 10-minute period over Station KMOX. Running steadily for 3 years. Club has nearly 500,000 members in 45 states and 6 foreign countries.

A Red Cross Play for the Radio. *Red Cross Courier*, Washington, D. C., March 15, 1930. *Free*. Full script of "One Working Day in Red Cross Service," a 15-minute radio play given by Lancaster (Pa.) Chapter. The announcer carries some of the heavy work in presenting bald facts.

More than 200 stations are using the twice-a-month broadcasts prepared by the U. S. Public Health Service, Washington. *Copies free*.

Every Wednesday, 5 p.m., via Station USYR (Syracuse, N. Y.) the Onondaga Health Association will broadcast the "Live a Little Longer Club."

Every Wednesday, 7:40 p.m., via WGY (Schenectady) New York State Department of Health continues its broadcasting which has been running regularly for several years.

Recent broadcasts include items listed below.

Connecticut State Department of Health: The Health Traffic Officer (the health officer).

New York City Health Department: Sleep and Rest, Help! Police!! I've Been Robbed!!! (health examinations), First Aid, Measles.

New York State Department of Health: The Weather and You, The Milk Problem Boiled Down.

U. S. Public Health Service: The Public Health Nurse.

#### EDUCATIONAL MATERIAL

Rural Health, by R. A. Felton and N. V. Short. New York State College of Agriculture, Ithaca, N. Y. 38 pp. What can be done; the county health department. Copy largely adaptable to other states. 10 cents.

National Tuberculosis Association, 370 7th Ave., New York, N. Y. Revised 16-page booklet listing "pamphlets and circulars, books, motion pictures, posters and periodicals" issued by the N. T. A. *Free*.

We list in this section from time to time educational material from commercial sources, usually those free from promotion of individual brands. Some day we hope for the evaluation of such publications and the thorough discussion of the use of material supplied by manufacturers, and the formulation of policies for their use by health workers.

Some Foods for Children (6 months to 6 years). Evaporated Milk Assn., 231 S. La Salle St., Chicago, Ill. *Free*.

The Cause and Prevention of Tooth Decay. 8 pp. Kolynos Company, New Haven, Conn. *Free*.

Household Refrigeration Bureau, National Association of Ice Manufacturers, 51 Chambers St., New York, N. Y. Series of pamphlets on the care of foods passed upon by a committee including representatives of Bureau of Home Economics of U. S. Department of Agriculture, American Hospital Association, American Home Economics Association, etc. *Free*.

## BOOKS AND REPORTS

Recent Advances in Preventive Medicine—By J. F. C. Haslam, M.C., M.D. (Edin.), M.R.C.P., D.P.H. With a Chapter on the Vitamins by S. J. Cowell. Philadelphia: Blakiston, 1930. 328 pp. Price, \$3.50.

This book is one of the "Recent Advances" series. The author has taken Sir George Newman's *Outline of the Practice of Preventive Medicine* as a framework around which to build his account of the progress in this line of medicine.

Opening with a chapter on eugenics, practically all the problems which are now engaging medical attention are given due consideration. In addition to eugenics, which necessarily brings in much concerning children, some 50 pages are given to childhood, an equal number to milk, and approximately 40 pages to diphtheria and scarlet fever; so it is evident that infancy and childhood get a large share of attention. The special chapter by S. J. Cowell on vitamins is excellent.

We wish particularly to commend the author's condemnation of vaccines against the common cold. The entire book deserves high praise, and only minor points are deserving of criticism. Calmette's vaccine is dubbed "B. C. G.," which is not the name the inventor gave to it. On page 112, he quotes Mummery's last paper as 1926, he having died that year, and on the next page he suggests that the views expressed may possibly not be the latest held by that writer. How shall we find out?

The book is admirably printed and can be recommended without reserve.

M. P. RAVENEL

Psychology and Industrial Efficiency—By Harold Ernest Burtt, Ph.D. New York: Appleton, 1929. 459 pp. Price, \$3.00.

On the premises that the employee has been hired by the proper scientific procedure, there is to be considered the important question of the most effective method of organizing his work from that point on. Thus the present volume deals with applied psychology in the matter of promoting industrial efficiency, the text being in everyday vocabulary.

The material is divided into 10 chapters, logically arranged with subheadings, various tables, graphs, footnotes, page references, and chapter summaries, with an adequate table of contents, but a rather brief index.

After the scope of the problem and its limitations there follows a fine discussion of applying educational principles to learning in industry, and a comprehensive review of economic methods of work for the individual and the group.

Fatigue is considered both from its psychical and its environmental relations—the latter rather too briefly, with no consideration of physiological origins and differences in such matters as nutrition, elimination, circulation, and bad personal hygiene, or the recognition of the importance of disease states and especially "silent sickness," as chronic degenerative afflictions are aptly called by Fisk. As some of these personal states are almost constantly bobbing up, and at least indirectly influencing the mental state, one feels they can hardly be overlooked for any group of workers, no matter how scientifically they may have been selected upon employment. Due attention is given to the reports of

the British Industrial Fatigue Research Board but the author overlooks Bedford's "Ideal Work Curve" as one of the possible methods of gauging fatigue in industry.

There is an excellent discussion on "Satisfaction and Morale" and a psychologist's view of the subject of accidents. A chapter on "Efficiency in Executive Work" rightly warns of "gold brick" psychology, "mental dynamisms" and similar quackery, and in an entertaining manner presents the subjects of attention, memory, and habit formation. It is claimed that industrial psychology is playing a larger rôle in Europe than in America, but we doubt if with as great success in view of the preponderance of industrial disputes abroad as contrasted with the present-day "get-together" policy of employer and employee in this country.

Coöperation of other experts with the psychologist, notably engineers, is cited. Truly the efficient management of the "human machine" requires the services of several types of experts, and at present there is not enough coöperation between them, each feeling that his own field about covers the subject.

This book is by an able and experienced psychologist already favorably known for his work on *Principles of Employment Psychology*. It considers a most important side of personnel management, with the aim of suggesting better methods of work and better results with the same effort.

EMERY R. HAYHURST

**Milk and Milk Products**—By C. H. Eckles, D.Sc., W. B. Combs, and Harold Macy, Ph.D. New York: McGraw-Hill, 1929. 379 pp. Price, \$3.50.

The latest of several recent contributions to the literature on dairy science is a more or less elementary textbook for agricultural students. It covers the

field in a thorough and comprehensive manner, discussing the composition and properties of milk, the various micro-organisms which influence it, the common dairy processes, the manufacture and use of dairy products, and their place as food. A chapter on market milk has a sound, but rather sketchy outline of sanitary methods. One striking characteristic of the book is that it has no bibliography and practically no references. The book is well printed, competently illustrated, and has a good index. It should prove of value to those who have to deal in an official or commercial capacity with milk and its many important products.

JAMES A. TOBEY

**The Art of Rapid Reading**—By Walter B. Pitkin. New York: McGraw-Hill, 1929. 233 pp. Price, \$2.50.

Mr. Pitkin offers a life-preserver to the man who is slowly sinking in the accumulation of books and periodicals that he knows he should read for his own best interests, but for which he cannot find time in his busy life. The public health worker should at least examine the proffered assistance.

The author argues that writing is improving and the output of printed matter is larger and increasingly better, but that our reading has not speeded up and improved in proportion. In the first part of his book, Mr. Pitkin diagnoses various reading troubles. In the second and third parts he suggests ways to improve "word habits" and "eye grasp." The fourth section is devoted to the art of "skimming," and suggests a technic for grasping salient points. The fifth section deals with practice exercises. He includes a progress chart upon which to record one's improvement, and a brief but adequate index.

The book is for study and would probably profit the conscientious stu-

dent. The eye tests are interesting and those made by this reviewer show an astonishing variation among individuals in the number of words taken in at a glance. The least valuable feature of the book is that it makes excellent dinner-table conversation.

Mr. Pitkin's examples of light, average, solid and heavy reading are not always apt. They would be more valuable if they were of more general interest. It is to be remembered, however, that the book is written for the busy business man who wishes to increase his capacity for informing himself. It does not relate to reading for pleasure or what Mr. Pitkin calls "revery reading." One puts aside the book with the reflection that we have had "The Art of Thinking," "The Art of Reading," and now we have "The Art of Rapid Reading." Will someone come to the rescue with "The Art of Remembering"?

W. M. RAYNE

**Bergey's Manual of Determinative Bacteriology: A Key for the Identification of Organisms of the Class Schizomycetes—By David H. Bergey. (3d ed.) Baltimore: Williams & Wilkins, 1930. Price, \$6.00.**

The general plan of the Manual is the same, except that it has been enlarged by the addition of new tribes and genera, and over 200 new organisms most of which fall into the genera of flavo-bacterium, pseudomonas, phyto-monas, lactobacillus, and bacillus, so that the keys for these genera have been re-fitted. The former dysentery group has been separated from typhoid under the euphonious name of "Shigella." Why our old friend *B. lactis aerogenes* should be separated from its associates *B. pneumoniae* and *B. rhinoscleromatis*, et al., and made the head of a separate genus is still beyond me. The only apparent distinction being that one occurs usually in the digestive tract and the other in the respiratory. The re-

cent attack of psittacosis might lead us to believe that such separations are doubtful, and depend mainly on the animal involved.

On the whole, however, there seems to be a greater degree of conformity to the original recommendations of the S. A. B. It still seems unfortunate that this book is accepted abroad as the final word on American opinion. Perhaps each succeeding edition may show improvement.

ROGER G. PERKINS

**The Visiting Teacher at Work—By Jane F. Culbert. New York: Commonwealth Fund Division of Publications, 1929. 235 pp. Price, \$1.50.**

"The aim of this book is to present in sensible and practical form a discussion of the professional standards, procedure, and administrative relationships of the visiting teacher." The lapse of more than twenty years since visiting teacher service was introduced into the public schools has made possible an authoritative study and treatment of these phases of health and education.

The book is divided into two parts: Work with the Child, and Professional Standards and Relationships. There is a group of appendixes covering types of records and forms, and also a bibliography.

The visiting teacher must ask of the school, "How can the school process best fit the needs of this child?"—of the home, "What in the family or home environment is preventing this child from realizing his potential power, and experiencing his best service in his civic relations?"—of the community, "What lack or obstacles for which the community is responsible are preventing this child from receiving his just share of opportunity for physical, mental, and spiritual growth?"

The problems with which she must most frequently deal are those of "poor



or failing scholarship, behavior, unfavorable physical and environment conditions, unsatisfactory relations with companions or with those in authority, hampering, unwholesome and personal traits."

The table of types of problems indicates that poor scholarship stands at the top of the list, being 37 per cent more common than any other cause. As poor scholarship frequently results from poor physical condition, or absence due to illness, it would seem that health problems enter more largely into the situation than the tabulation (410 cases of special health problems out of a total of 11,588 cases) would indicate. This seems proved by a later table, showing the "factors in the children themselves considered by the visiting teacher in making a diagnosis and plan of treatment," which places physical disabilities at the top of the list.

As to the attitudes and conditions existing in the school as potent factors in affecting adjustment, that of an unsympathetic teacher is the one most commonly found. The most effective measure in assisting the school to adjust the children was found to be "bringing about better understanding of home conditions."

To be successful, the visiting teacher should know first the child and its family; second, the community; third, the schools. She must demonstrate that she is neither a "fad" nor a "fancy." She must establish friendly and co-operative relations with school principals, teachers, nurses, and with other specialists who come in contact with pupils. The most important relation, outside of that with the child itself, is that with the classroom teacher.

Miss Culbert, being Secretary of the National Committee of Visiting Teachers, and thoroughly familiar with their activities throughout the country, is in a peculiarly advantageous position to

compile a book of this sort. Its content should be part of the information of all teachers, principals, and other school administrators, of school physicians and school nurses, of social workers, mental hygienists, and other specialists in child problems.

Somewhat closer punctuation would make the text easier reading.

CHARLES H. KEENE

**Our Baby's First Seven Years—By Hermien D. Nusbaum. Chicago: Reilly and Lee, 1928. 85 pp. Price, Keratol Cloth, \$2.50, Silk Moire, \$4.00.**

This book is planned for a combined physical and sentimental record of a child's first seven years. It is a very attractive and complete "Baby Book" the filling of which will be a joy to intelligent parents and a real value to the child.

A foreword by Dr. J. B. DeLee stresses the importance of a careful, full "record of physical changes, of growth, of sickness, and other conditions to which the physician could refer for discovery of constitutional tendencies or of acquired susceptibilities." Ample space is provided for records of this nature, a partial list of which follows:

- Doctor's observations of facts of birth
- Accurate measurements
- Identification marks, including foot and finger prints
- Records of weight, height and growth
- Complete form for medical examination
- Feeding records
- Muscular and mental development
- Teeth tables
- Personal habits
- Illness and injuries
- Preventive measures against diseases

A blank form for a three-generation pedigree is provided. A page for "Outstanding talents and characteristics of antecedents" will probably remain blank in peace-loving families.

A carefully selected list of pamphlets, magazines, and books dealing with the physical and mental health of children

and parental responsibilities is given which should be of real assistance to the conscientious father and mother.

The only suggestion that might be made for the completion of the health pages of the book is the inclusion of scarlet fever and measles in the list of diseases against which preventive measures are taken.

The binding, illustrations in colors, and the general make-up of the book are very attractive indeed and no nicer present could be given to the household that is boasting a new baby.

JOHN HALL

**Burdett's Hospitals and Charities, 1930.** *Being the Year Book of Philanthropy and the Hospital Annual—Founded by Sir Henry Burdett, K.C.B., K.C.V.O.* London: Nursing Mirror, Ltd., 24 Russell Square, W.C. 1, 1930.

The 1930 edition of this valuable guide for the 40th year of its existence is at hand. The entire volume concerns Great Britain and Ireland. The chapter "The Voluntary Hospitals" gives a review which is of interest to all concerned in such institutions. Among the features are the facts that more than half the hospitals which made returns showed deficits amounting in all to considerably more than 5 million dollars; that the number of available beds increased by 3,095, 81 per cent of which were occupied daily; that motor accident cases have cost voluntary hospitals approximately a million dollars during the year, and are on the increase, becoming constantly a greater burden, so that compulsory insurance has been suggested. The cost of radium has become a matter of concern to all hospitals.

During the year an International Hospital Conference was held in Atlantic City, N. J., at the invitation of the American Hospital Association, at which new ground was broken.

With the exception of these features, the book is made up of a systematic directory of institutions and philanthropic bodies, medical schools and colleges, nursing and convalescent institutions, institutions for the blind, sanatoriums, etc. An admirable index makes its material available. As a book of reference, it is extremely valuable, and the information it contains may come in handily for the many thousands of Americans who will visit England and Ireland during the year and are liable to fall ill while abroad.

M. P. RAVENEL

**The Rat. A World Menace—By A. Moore Hogarth, F.E.S.** *With Preface by Sir Thomas Horder, Bart.* London: John Bale, Sons and Danielsson, Ltd., 1929. 112 pp. Price, \$2.50.

This little book is timely, as we have recently been told that the rat population of the United States is more than 125 million, and that each person in this country pays \$2.00 per annum for the upkeep of one rat.

The rat is an economic scourge; from the public health standpoint, it is a menace. The preface by Sir Thomas Horder expresses surprise that so little has been done toward the extermination of carriers of disease. In England, there is now the College of Pestology, the object of which is to teach the danger of carriers and the methods of dealing with them.

The present volume gives the history, geographic distribution, species, habits, etc., of rats; tells of their fecundity; the amount of food consumed and danger caused; describes methods of getting rid of them, and preventing their increase.

The book is small and light, and can be heartily commended for general as well as professional reading. Certainly increased activity in the destruction of rats is needed throughout the world.

M. P. RAVENEL

**A System of Bacteriology in Relation to Medicine, Vol. IV**—By H. J. Bensted, W. Bulloch, L. Dudgeon, A. D. Gardner, E. D. W. Greig, D. Harvey, W. F. Harvey, T. J. Mackie, R. A. O'Brien, H. M. Perry, H. Schutze, P. Bruce White, and W. J. Wilson. London: His Majesty's Stationery Office, 1929. 482 pp. Price, \$6.00.

The second volume of *A System of Bacteriology in Relation to Medicine*, published by the Medical Research Council, is No. IV, devoted largely to the organisms usually described as the colon-typhoid group. Needless to say, these are among the most interesting and important organisms met with. This alone would make the volume of outstanding importance. They are divided into *Bacillus Typhosus*, 66 pages; Salmonella Group, 65; Dysentery Group, 94; Colon Group and Similar Bacteria, 81. Approximately 110 pages are given to The Cholera Vibrio and Related Organisms, and 27 to the Pasteurella, to which the name of Trevisan, who proposed the name in honor of Pasteur, is attached. A final short chapter is given to *Pseudotuberculosis Rodentium*.

The general plan is to consider each group as a whole, after which the individual organisms are taken up in detail. The histories written by W. Bulloch are deserving of especial mention. It is safe to say that nowhere can one find the essential facts more clearly and concisely put. Under typhoid fever, he calls attention to a fact very little known—that Bretonneau, the author of the classic description of diphtheria, was the first to maintain that typhoid fever was contagious, that it was accompanied by a specific intestinal "eruption," and that one attack conferred protection. This was written in 1829, and resurrected in 1922 by Dubreuil-Chambardel.

Some of the classifications are rather surprising. The fluorescens-pyocyanus group is included in the chapter on the colon, and we are even given some points

of differentiation between the pyocyanus and the colon.

The book as a whole calls forth nothing but praise. Every subject is discussed as fully as is necessary, and the reader is left with a clear conception of the matter under discussion. In every respect it is up-to-date. Each chapter ends with a well selected bibliography. There is a welcome absence of the endless discussions too often found, which end nowhere.

Everyone who has seen the two volumes so far issued will look forward with eagerness to the rest of the series. The printing is excellent, the paper light with mat surface. If the other volumes keep up to the high standard of those issued, as we have no doubt they will, it can be stated with assurance that there will be no publication in the world containing a more authoritative exposition of our knowledge of the science of bacteriology.

M. P. RAVENEL

**The Village Doctor**—By Sheila Kaye-Smith. New York: Dutton, 1929. 266 pp. Price, \$2.50.

This charmingly written story conveys a convincing health lesson. A well educated, up-to-date physician whose health requires him to leave London acquires a practice in an old rural district. His ideas about pure drinking water are combated with the old, old argument about fathers and grandfathers having used the supply without harm. Finally a severe epidemic of typhoid fever predicted by the new doctor convinces the authorities that they are wrong in using the same stream both as a sewer and as a source of water. However, his chief convert, who is also a political power in the community, is made by the doctor's kindly advice concerning a highly valued sick cow!

The book has had 17 printings in 2 months, which proves that it is charmingly written, and has the human interest quality.

M. P. RAVENEL

# A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

**Meningitis Control**—The Massachusetts State Health Department offers a meningitis diagnostic service to the physicians of the state similar to the services it performs for cases of poliomyelitis. Local boards are urged to isolate cases for 2 weeks and until symptoms clear up; contacts are isolated for 10 days.

ANDERSON, G. W., and BIGELOW, G. H. Epidemic Meningitis Control. *New Eng. J. Med.*, 202, 11: 518 (Mar. 13), 1930.

**Standard Methods of Water Analysis**—This is a report of the Committee of Standard Methods for the year 1928–1929. Much valuable research is reported upon and 25 recommendations are recorded.

ANON. Report of Committee No. 1 on Standard Methods of Water Analysis. *J. Am. Water Works A.*, 22, 2: 242 (Feb.), 1930.

**Self-Disinfection by the Skin**—The power of the skin to destroy bacteria was tested. The results of the tests are not entirely clear to this superficial reviewer.

ARNOLD, L., *et al.* The Self-Disinfecting Power of the Skin. *Am. J. Hyg.*, 9, 2: 345 (Mar.), 1930.

**Responsibility for Cancer Control**—The responsibility of the health official, the research worker, the dentist, practicing physician, nurse and social worker, the educator, journalist, etc., in the world-wide cancer control project is allotted to each group.

BLOODGOOD, J. C. Cancer as a World Problem. *New York State J. Med.*, 30, 5: 255 (Mar. 1), 1930.

**Milk Sanitation Essentials**—The diseases to be guarded against are diar-

rhea, tuberculosis, other communicable diseases (including undulant fever). The answer is, of course, pasteurization; the job, stimulating public demand for pasteurized milk.

BROOKS, P. B. Essentials vs. Non-Essentials in Milk Sanitation. *New Eng. J. Med.*, 202, 12: 582 (Mar. 20), 1930.

**British Maternity Service**—This discussion of the objectives and methods to be employed in providing a national maternity service will be read with interest by American health workers.

CASSIE, E. A National Maternity Service. *J. Roy. San. Inst.*, 50, 9: 581 (Mar.), 1930.

**Influenza Epidemics**—This is a detailed study of the origin and progress of 6 epidemics of influenza which occurred from 1920 to 1929. A quarter of a million deaths were recorded, one-half as many as in the pandemic of 1918–1919. An important contribution.

COLLINS, S. D. Influenza-Pneumonia Mortality in a Group of about 95 Cities in the United States, 1920–1929. *Pub. Health Rep.*, 45, 8: 361 (Feb. 21), 1930.

**Nuclear Response in Yellow Fever**—Reporting studies leading to the conclusion that the nuclear response in yellow fever is of the same general type which occurs in chicken pox, herpes, and other virus diseases.

COWDRY, E. V., and KITCHEN, S. F. Intracellular Inclusions in Yellow Fever. *Am. J. Hyg.*, 11, 2: (Mar.), 1930.

**Colds**—An inclusive review of laboratory and field research in regard to the cause and prevention of colds leading to these conclusions: colds are "seasonable"; no microorganism has been demonstrated; no prophylactic

method is of unquestioned value. Suggestions for further research are appended.

DOULL, J. A. Acute Endemic Upper Respiratory Disease. *Canad. Pub. Health J.*, 21, 3: 105 (Mar.), 1930.

**Visiting Nurse and Hospital Service**—An interesting story, well told, of the development and organization of a county nursing service, from and by the Englewood (N. J.) hospital. The combination of administration works to the mutual benefit of each.

EDGEComb, M. E. Public Health Nursing under the Englewood Plan. *Pub. Health Nurse*, 22, 3: 126 (Mar.), 1930.

**New Haven Tuberculosis Program**—The organization for the control of tuberculosis in New Haven has unique features. The generalized nursing plan and the advantages of the polyclinic are discussed.

EDWARDS, H. R. The Tuberculosis Program in New Haven. *Am. Rev. Tuberc.*, 21, 2: 233 (Feb.), 1930.

**Tuberculosis Research**—Telling about the fundamental chemical studies upon the tubercle bacillus and the physiological effects of the chemical fractions. The promising work will be continued in a number of widely separated laboratories.

EMERSON, K. Research in Tuberculosis. *J. A. M. A.*, 94, 11: 759 (Mar. 15), 1930.

**Venereal Diseases in Toronto**—A survey is reported of venereal disease cases under medical care in the city of Toronto. The rate 8.4 per 1,000 is lower than the corresponding rates reported from 14 cities in the United States.

FENWICK, C. P. Venereal Disease Survey of Toronto. *Canad. Pub. Health J.*, 21, 3: 132 (Mar.), 1930.

**Yellow Fever Virus**—This reports the inability to demonstrate the pres-

ence of any particular organisms in the blood of monkeys infected with yellow fever. Other important findings are recorded.

FROBISHER, M. Properties of Yellow Fever Virus. *Am. J. Hyg.*, 11, 2: 300 (Mar.), 1930.

**Cancer Bacteria?**—Reporting the elaborate life cycle of an exceedingly pleomorphic microorganism which the author succeeds in recovering from various types of malignant lesions.

GLOVER, T. J. The Bacteriology of Cancer. *Canada Lancet*, 74, 3: 92 (Mar.), 1930.

**Underpar School Children**—Twenty-eight tuberculosis suspects were given cod liver oil; they gained an average of 6.7 lb. compared to 3.25 lb., the average of normal school children of the same age. At the same time there was experienced a decrease in abnormal temperatures and an improvement in school attendance and scholarship.

HOLMES, A. D., and ACKERMAN, H. L. The Value of Cod Liver Oil for Underpar Children of School Age. *New Eng. J. Med.*, 202, 10: 470 (Mar. 6), 1930.

**European Milk Borne Epidemics**—Epidemiologic studies of milk borne communicable disease outbreaks are reported. They make a valuable addition to America's "exhibit A." Professor Madsen's answer is the same as ours: efficient pasteurization.

MADSEN, T. J. M. Milk Epidemics. *Pub. Health*, 43, 6: 168 (Mar.), 1930.

**Water Supply Contamination**—Ingenious devices thought out by consumers for the contamination of water systems form an interesting commentary on human frailties.

MORRIS, S. B. Contamination of Water Systems by Consumers' Water Uses. *J. Am. Water Works A.*, 22, 2: 180 (Mar.), 1930.

**British Experience with Alcoholism**—The causes of the "remarkable decline in mortality of diseases associated with excessive consumption of al-

cohol" are: changes in personal hygienic habits; enormous extension of counter-attractions to the public house; curtailment of hours of sale. Educational campaigns for temperance are suggested for the use of local authorities. Whether the British method is inferior to our constitutional short-cut is a field for absorbing, but largely profitless, speculation.

NEWMAN, G. Alcohol and the Public Health. *Med. Off.*, 43, 8: 83 (Feb. 22), 1930.

**Scarlet Fever Prophylaxis**—Contacts given human immune serum developed scarlet fever to the extent of 2.9 per cent; 12.8 per cent of the unprotected contacts developed the disease. Immunity lasts not longer than 3 or 4 weeks. Prophylactic treatment is recommended for very young and infirm contacts.

MEADER, F. M. Scarlet Fever Prophylaxis. *J. A. M. A.*, 94, 9: 622 (Mar. 1), 1930.

**Heredity vs. Environment**—Sir Thomas's presidential address at the Institute of Hygiene (British) explores again this ancient and familiar controversy, concluding hopefully, "In some unknown manner a close association is established between structure and function so that while heredity perpetuates, fresh powers from environmental sources are added whereby heredity becomes enriched with the passing of the generations and the further evolution of the race is secured."

OLIVER, T. Heredity, Environment, Opportunity. *Med. Off.*, 43, 9: 97 (Mar.), 1930.

**Etiology of Poliomyelitis**—Further reports on the study of the pleomorphic diplococcus of poliomyelitis and the results of treatment of cases with antiserum. This controversy bids fair to equal that raging about BCG.

ROSENOW, E. C. Poliomyelitis Antistreptococcus Serum. *J. A. M. A.*, 94, 11: 777 (Mar. 15), 1930.

**Vitamins in Malted Milk**—Malted milk was found to be rich in vitamins A, B ( $B_1$ ) and G ( $B_2$ ) when assayed biologically.

QUINN, E. J., and BRABEC, L. B. The Vitamin A, B, and G Content of Malted Milk. *J. Home Econ.*, 22, 2: 123 (Feb.), 1930.

**Tuberculosis Decline**—Is tuberculosis, improved physical status, or better public health facilities the cause of the decline in tuberculosis case and death rates? It would not be fair to the author to give away his answer here. The paper is easily available; read it and the ensuing discussion.

SHEPARD, W. P. A Review of Factors Involved in the Decline of Tuberculosis. *J. A. M. A.*, 94, 10: 697 (Mar. 8), 1930.

**Child Guidance**—Looking back over the years of experience in child guidance, the author concludes that the clinics have helped parents, social workers, nurses, pediatricians, psychiatrists, and persons dealing with juvenile delinquency, as well as the children actually studied.

SMITH, S. K. Child Guidance Clinics. *J. A. M. A.*, 94, 10: 710 (Mar. 8), 1930.

**Dysentery Outbreak in Prison**—An outbreak of dysentery (Flexner type) in a prison provided an unusual opportunity for the study of the disease. The results of administering bacteriophage were inconclusive.

STANLEY, L. L. Prison Epidemic of Flexner's Dysentery. *J. A. M. A.*, 94, 12: 857 (Mar. 22), 1930.

**Weighing and Measuring**—Shall we weigh and measure school children, in view of the American Child Health Association's findings? Weigh?—Yes, with certain limited objectives. Use height-weight tables to determine nutritional status?—No.

WHITNEY, A. The Weighing and Measuring of School Children. *Child Health Bull.*, 6, 2: 39 (Mar.), 1930.

# HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Connecticut—Connecticut's "Banner Health Year" was 1927. As shown by the 43d report of the 51st year of the State Department of Health for the year ending June 30, 1928, the 1927 general death rate of 10.6 per 1,000 is a record low, as was the infant mortality rate of 58.4 per 1,000 births and the specific death rates for typhoid fever (1.1 per 100,000), scarlet fever (1.4), whooping cough (2.5), tuberculosis, all forms (66.8), pulmonary tuberculosis (57.6), and diarrhea under 2 (11.5). The prevalence of communicable diseases in the state was at a minimum. The total of 24,428 cases of reportable diseases was the smallest since 1917.

The task of surveying the state for hospitals required to be licensed by the department, by the law passed in 1927, was carried out by the Bureau of Preventable Diseases. There were 45 hospitals licensed for the year, of which number 29 were for chronic and convalescent cases only. This bureau also introduced the plan of sending out forecasts of threatened epidemics of diphtheria, smallpox, and poliomyelitis to the health officers and physicians of the state.

The allocation of births and deaths was begun by the Bureau of Vital Statistics, to be effective for the year 1927 and thereafter. A form notice is sent to the registrar to whose jurisdiction the death is being charged, no actual transference of records taking place, though copies of birth and death records of non-residents are sent to the registrars of the cities where the parties concerned are residents. The allocation of births is done according to the residence of the mother.

The major activities of covering 110 water supplies furnishing water to 136 communities, carrying on the super-

vision of 16 filter plants and 44 chlorination plants, the covering of 33 sewerage systems having some form of treatment before final disposal, the checking and supervision of swimming pool operations, and the shellfish program, constitute the major activities of the Bureau of Sanitary Engineering. In addition, the inspection and control of a rapidly increasing number of wayside eating places and summer boarding camps is a state necessity covered by this bureau.

The routine work in child hygiene has increased; from 50 to 55 well child conferences were operated with the assistance of local physicians and officials during the year. A total of 7,819 children attended, in which 726 physical defects were found. The Summer Round-up of children about to enter school for the first time, which was started two years before, was held in 1927 in 32 towns and covered over 1,000 children. The May Day Program initiated by the American Child Health Association has been designated by the governor as Child Health Day.

The volume covers 411 pages, containing tables and charts illustrating every phase of state health activity. Numerous photographs are interspersed throughout the text, which is improved for use by an excellent table of contents and an index.

Palo Alto, Calif.—This annual report for the calendar year 1929 came off the press February 21—an excellent record! The report opens with a clear organization chart of the health department, followed by 7 photographs skillfully arranged on a single page to acquaint the reader at a glance with the scope of activities.

On the basis of 13,200 population, a

resident death rate of 9.9 per 1,000 is recorded. There were 10 infant deaths, giving an infant mortality rate of 62.1, but for the 10-year period 1920-1929, an infant mortality rate of 41.3 is noted. During the year bonds were voted for a new hospital to cost \$450,000 which will provide isolation and laboratory facilities for the health department in addition to general hospital provisions. A new milk ordinance provides that all milk must come from tuberculin tested cows, and that all milk except certified and guaranteed raw milk must be pasteurized.

During 1929 there were 11 cases of diphtheria, but there have been no deaths from this disease in Palo Alto since 1921, and but 1 death since 1911. Toxin-antitoxin was furnished to immunize 310 persons, and 6 diphtheria carriers were discovered and isolated. At the end of 1928, 10 cases of tuberculosis were known to exist in the city and 12 new cases were reported during the year 1929 with 8 deaths. Expenditures in 1929 by all agencies for public health work totalled \$17,422, of which \$12,892 was expended through the health department, the remainder being provided by school boards, the Parent-Teacher Association, and tuberculosis scar sales. The allotment to health work in the Palo Alto city budget was 3.2 per cent of the total for all activities.

**Racine, Wis.**—Wisconsin's second city rates in the honor list of health officers' annual reports for 1929. This 64-page mimeographed report abounds in valuable statistical charts and tables and in enlightening descriptive text. The cost of 125 copies, exclusive of the time required in preparation by the regular staff, was \$73.11. There are a 1-page table of contents at the front and a 3-page alphabetical index at the back, which facilitate reference to special subjects.

A classified financial statement compares expenditures of 1929 with those of three earlier years and with appropriations for 1930. For purposes of comparison of the data of the current year with previous experience, figures are presented in tables for the first and last years of the health officer's incumbency, plus the median for the 5-year period. The *Appraisal Form* of the American Public Health Association has been effectively used in the evaluation of practices and services.

Plans have been completed for a new city hall in which the health department will be conveniently housed according to plans drawn by the health officer and accepted by the administration. The milk ordinance in the city was amended during 1929 to provide for compulsory pasteurization of all milk except certified.

A centralized family file has been established in which are recorded all data pertaining to a given family, such as birth, death, marriage, contagious disease, school physical examination, clinic attendance and any other contact which might be had with the health department. The estimated number of families in Racine is 15,000, and the new family file contains nearly 9,000 family records as a result of the first year of its service. Such a broad basis of contact with the people indicates that the health department is directly serving a large percentage of the citizens.

The most important new project of the year was the launching of a campaign for the examination of preschool children within 4 months before entering school. This campaign was headed by the American Legion through a committee of which the health officer was chairman. In addition to the Legion and auxiliary, the participants in this project were the American Red Cross, the County Medical Society, the public schools, the Catholic parishes, and pa-



rochial schools and the Junior League. The Medical Society sponsored 19 special clinics served by physicians appointed by the president, assisted by health department nurses. The health officer personally examined children at the city hall and the Red Cross opened its baby clinics to assist in the work. Over one-third of the 900 children invited for examination responded, 332 were examined thoroughly, and 52 qualified for Blue Ribbons presented by the Legion at a party at which the Legion auxiliary members were hostesses. All records were made available to the school which each child entered in September. One result of this project was an improvement in the *Appraisal* score for preschool hygiene from 34 points in 1928 to 60 points in 1929.

Ottawa, Canada—One of the most important factors in the 1929 report is the account of the epidemic of poliomyelitis which began in July and lasted until October. There were 176 cases with only 4 instances where 2 cases were reported from the same premises. The weather was dry, the rainfall being below the average. The treatment with convalescent serum was found to be effective.

The report shows the population for 1929 to be 125,496, with a general death rate of 12.26, which is higher than last year, and a birth rate of 23.84, which is the lowest rate yet recorded. The increase from 104.01 as in 1928 to 118.6 in infant mortality rate accounts for 20 per cent of all deaths. The chief cause of infant deaths was respiratory disease.

There was a reduction in the tuberculosis rate to 59.9 per 100,000, 78 per cent of the deaths being from pulmonary tuberculosis. The cancer rate increased, causing 8.83 per cent of all deaths. An excess of measles was due to an epidemic in February with 786

cases. The total incidence of measles was 1,907 cases for the entire year.

Vienna, Austria—An interesting report has been submitted of the dental work that is being done in the schools of Vienna by the 15 dental clinics for public school children, and 3 for institutional children serving 16 districts. This program was begun in 1922.

Each clinic has an operating room, a waiting room for children and one for the escorts of the children. It was found that the children were less nervous if they were kept together where they could play and amuse themselves before the examination.

There are 37 dentists and assistants giving services, each dentist making about 20 examinations a day. The entire program is under the supervision of a chief surgeon, who reports monthly to the municipal Board of Health and a head nurse who is in charge of all supplies. The maintenance cost for 1929 was \$63,234.00 and the budget required for 1930 will be \$72,171.00.

The children are given an examination and treatment twice a year up to the 14th year of age, and then advised as on their dental care up to 18. If a child can be examined he must, ~~con-~~ the consent of his parents; if their consent is withheld he is excluded from the clinic. Before beginning an operation each child must brush his teeth under the supervision and instruction of the nurse. The sum total of children being cared for by the school dental clinics was 55,415 with probably 64,000 in 1930.

Sacramento, Calif.—The report for 1929 shows a marked increase in epidemic meningitis, 80 cases with 38 deaths against 15 cases with 8 deaths for 1928. There was also an increase in pneumonia and heart disease but a

slight decrease in cancer and in infant mortality, from 67.5 to 63.8. The birth rate was practically the same as last year. The city clinics rendered 12,633 services including 4,000 treatments for syphilis and an immunization serv-

ice of 2,697. The attendance at the health center showed a slight decrease over last year due perhaps to the establishment of the Sacramento Hospital Well-Baby Clinic, for babies born in the hospital.

## BOOKS RECEIVED

SEWERAGE AND SEWAGE DISPOSAL. A Text-book. (2d ed. rev.) By Leonard Metcalf and Harrison P. Eddy. New York: McGraw-Hill, 1930. 783 pp. Price, \$6.00.

THE MONEY VALUE OF A MAN. By Louis I. Dublin and Alfred J. Lotka. New York: Ronald Press, 1930. 264 pp. Price, \$5.00.

YOURSELF, INC. THE STORY OF THE HUMAN BODY. By Adolph Elwyn. New York: Brentano's, 1930. 320 pp. Price, \$3.50.

WHAT IS EUGENICS? By Leonard Darwin. New York: Galton Pub. Co., 1929. 88 pp. Price, \$1.00.

POSTERITY. By Frank W. White. New York: Galton Pub. Co., 1930. 139 pp. Price, \$1.50.

PERSONAL HYGIENE FOR NURSES. By Seneca Egbert. Philadelphia: Davis, 1930. 347 pp. Price, \$2.50.

SYMPOSIUM ON PHYSICAL EDUCATION AND HEALTH. Compiled and edited by Jay B. Nash. New York: N. Y. University Press, 1930. 320 pp. Price, \$2.00.

THROUGH THE STATES WITH A SEEING EYE. By Richard J. A. Berry. Bristol: John Wright & Sons, 1930. 200 pp. Price, \$1.75.

TEACHERS ON MUSSEL PURIFICATION. By R. W. Hodgson. London: H. M. Stationery Office, 1928. 498 pp. Price, \$7.00.

PUBLIC HEALTH ASPECTS OF DENTAL DECAY IN CHILDREN. By Raymond Franzen. New York: American Child Health Association, 1930. 121 pp. Price, \$1.25.

THE ALIEN IN OUR MIDST. Edited by Madison Grant and Charles Stewart Davison. New York: Galton Pub. Co., 1930. 238 pp. Price, \$3.00.

THE FILENE STORE. A STUDY OF EMPLOYEES' RELATION TO MANAGEMENT IN A RETAIL STORE. By Mary LaDame. New York: Russell Sage, 1930. 541 pp. Price, \$2.50.

NATIONAL CONFERENCE OF SOCIAL WORK. SAN FRANCISCO, 1929. Chicago: University of Chicago Press, 1930. 682 pp.

THE EPIDEMIOLOGY AND CONTROL OF MALARIA IN PALESTINE. By Israel J. Kligler. Chicago: University of Chicago Press, 1930. 240 pp. Price, \$5.00.

BIO-DYNAMICS: THE BATTLE FOR YOUTH. By Boris Sokoloff. New York: Covici, Friede, 1930. 230 pp. Price, \$3.00.

THE STORY OF SAN MICHELE. By Axel Munthe. New York: Dutton, 1929. 530 pp. Price, \$3.75.

NERVE TROUBLES, CAUSES AND CURES. By Cecil Webb-Johnson. New York: Stokes, 1930. Price, \$1.00.

BEFORE THE BABY COMES. A Practical, Non-Technical Manual for Prospective Mothers. (rev. ed.) New York: Harper, 1929. 170 pp. Price, \$2.00.

REMINISCENCES OF GEORGE MARTIN KOBER, M.D., LL.D. Vol. 1. Published under the Auspices of The Kober Foundation of Georgetown University. Washington, D. C.: Kober-Foundation, 1930. 403 pp.

IMMUNITY IN INFECTIOUS DISEASES. A Series of Studies. By A. Besredka. Baltimore: Williams & Wilkins, 1930. 364 pp. Price, \$5.00.

CONSTRUCTIVE HYGIENE. (4th ed.) By Thomas A. Storey. Stanford University: Stanford University Press, 1930. 236 pp. Price, \$2.50.

SLEEP. WHY WE NEED IT AND HOW TO GET IT. By Donald A. Laird and Charles G. Muller. New York: John Day, 1930. 214 pp. Price, \$2.50.

BREAD. A Collection of Popular Papers on Wheat, Flour and Bread. By Harry Snyder. New York: Macmillan, 1930. 293 pp. Price, \$2.50.

YOUTH AND CRIME. A Study of the Prevalence and Treatment of Delinquency among Boys over Juvenile-Court Age in Chicago. By Dorothy Williams Burke. Washington: Government Printing Office, 1930. 205 pp. Price, \$35.

COMMON COLDS: Causes and Preventive Measures. By Leonard Hill and Mark Clement. London: Heinemann, 1929. 126 pp. Price, \$3.00.

HARVEY W. WILEY. An Autobiography. Indianapolis: Bobbs-Merrill, 1930. 339 pp. Price, \$5.00.

# NEWS FROM THE FIELD

## SUMMER SCHOOL COURSES IN PUBLIC HEALTH

THE following universities and technical schools are offering courses in public health and preventive medicine during their summer sessions. While this is not a complete list of schools giving such courses, it represents those replying to a questionnaire sent out by the American Public Health Association.

### *University of California, Berkeley, Calif.*

June 30–August 9

Child Welfare  
Health of the School Child  
Public Health Nursing  
Elementary Epidemiology  
Elementary Public Health

### *University of Chicago, Chicago, Ill.*

June 16–July 23 (First Term)

July 24–August 29 (Second Term)

Public Hygiene  
Immunity in Relation to Preventive Medicine (First Term)  
Sanitary Surveys  
Field of Public Health Nursing  
Supervision of Public Health Nursing  
School Hygiene  
Physical Education  
General Bacteriology  
The Pathogenic Bacteria  
Parasitology  
Health Education  
Personal Hygiene  
Physiology of Nutrition  
Statistics  
Filterable Viruses  
Medical Entomology (Second Term)  
Advanced Bacteriology, Parasitology, Immunology and Public Health  
Theoretical Bacteriology and Parasitology

*Columbia University—DeLamar Institute of Public Health, College of Physicians and Surgeons, New York, N. Y.*

June 16–July 2

School Health Supervision  
*Teachers College, New York, N. Y.*  
Home and Community Hygiene  
Child Hygiene  
Public Health Administration  
Mental Hygiene  
Administration of Health Work in Schools  
Teaching Problems in Health Education  
Methods of Health Education  
Public Health Nursing  
Methods of Teaching in Sight Conservation Classes  
Methods of Teaching Lip-reading to Deafened Children  
Methods of Teaching in Fresh Air Classes  
Health Education in Continuation Schools  
Safety Education  
Social Hygiene

### *Cornell University, Ithaca, N. Y.*

July 5–August 15

Physical Education  
Measurements of School Children  
Hygiene of the School Child and Adolescent  
Health Inspection of School Children  
Gymnastics and Dancing

### *Duke University, Durham, N. C.*

June 10–July 19

Research in the Organization and Administration of Health Education  
School Hygiene and Health Education  
Physical Education in the Elementary School  
Personal and School Hygiene

*University of Georgia, Athens, Ga.*

June 23–August 22

Educational Hygiene  
Mental and Educational Measurements  
Bacteriology  
Sociology

*Harvard University, Cambridge, Mass.*

July 7–August 6

Principles and Problems of Hygiene  
Physical Education

*University of Illinois, Urbana, Ill.*

June 16–August 9

Organization and Supervision of Health  
Education in the Elementary Schools  
Physical Education  
School Hygiene  
Health Education and Corrective Gymnastics

*State University of Iowa, Iowa City, Ia.*

June 9–July 18 (First Term)

July 21–August 21 (Second Term)

Hygiene  
Advanced Hygiene  
Hygiene of Swimming Pools, Gymnasiums, Camps  
Principles of Physical Growth and Measurements  
Supervision of Public School Physical Education  
Administration of Physical Education and Athletics  
Medical Supervision of Athletics  
Corrective and Remedial Gymnastics  
The Health Education Program in Elementary Schools  
Seminar in Public Health

*Johns Hopkins University, Baltimore, Md.*

June 30–August 8

The Elements of Hygiene and Preventive Medicine  
School Hygiene and Vital Statistics

*Massachusetts Institute of Technology, Cambridge, Mass.*

July 7–August 15

Methods of Teaching General Biology  
Bacteriology  
Health Education Methods  
Health Education Subject Matter  
Public Health Laboratory Methods  
Public Health Institute for Health Officers and Other Public Health Workers

*University of Michigan, Ann Arbor, Mich.*

June 30–August 8

## General Hygiene and Public Health

## School Hygiene

## Methods and Materials in Health Education

## Child Hygiene

## Principles of Public Health Nursing

## Organization and Administration of Public Health Nursing

## Applied Nutrition

## Tuberculosis

## Medical Social Case Work

## Vital Statistics

## Public Health Law and Administration

## Public Health Institutes

*Michigan State College, East Lansing, Mich.*

June 24–August 1

## Medical Biology

## Bacteriology

## Hygiene

## Pathology

## Physiology

*University of Minnesota, Minneapolis, Minn.*

June 17–July 26

## Elements of Preventive Medicine

## Maternal and Child Hygiene

## Tuberculosis and Its Control

## Principles of Public Health Nursing

*University of Missouri, Columbia, Mo.*

June 9–August 1

## Physical Education

## Nursing

*University of New Mexico, Albuquerque, N. M.*

June 9–August 2

## The Elements of School Health

## Educational Hygiene

*New York University, New York, N. Y.*

July 7–August 15

## Child Hygiene

## Principles of Teaching Health

## Methods of Teaching Health

*Northwestern University, Evanston, Ill.*

June 23–August 16

## Personal Hygiene

*University of Pennsylvania, Philadelphia, Pa.*

July 7–August 16

## Hygiene

## Physical Education

*Pennsylvania School of Social and Health Work, Philadelphia, Pa.*

June 23–August 1

## Public Health Nursing

Social Problems  
Nutrition  
School Nursing  
Tuberculosis and Its Control

*University of Rochester, Rochester,  
N. Y.*

June 25–August 1  
Methods in Health Education Activities

*Rutgers University, New Brunswick,  
N. J.*

June 30–August 8  
Public Health  
Preventive Medicine  
First Aid

*Stanford University, Stanford Univer-  
sity, Calif.*

June 19–August 30  
Public Health Nursing  
Health Department Administration  
Physical Education and Hygiene

*Syracuse University, Syracuse, N. Y.*

July 1–August 8  
Hygiene

*University of Virginia, University, Va.*

June 16–July 26 (First Term)  
July 28–August 29 (Second Term)  
Hygiene and Sanitation  
Sex Character Education  
Biochemistry  
Bacteriology  
Physical Education  
Human Physiology

#### UNIVERSITY OF FLORIDA

THE University of Florida, Gainesville, Fla., offered for the first time this year a Short Course in Water and Sewage Treatment from April 8 to 11. For this course the university has been fortunate in obtaining on its faculty state and government officials, engineers, water works officials and others prominent in the fields of water and sewage treatment.

#### KENTUCKY

THE Governor of Kentucky has appointed the following to the State Board of Health, and their appointments were confirmed by the Senate of Kentucky on March 20, 1930: Dr. E. M. Howard, *President*, Dr. A. T. Mc-

*University of Washington, Seattle,  
Wash.*

July 18–July 25 (First Term)  
July 28–August 28 (Second Term)  
Principles of Physical Education  
Physical Education Administration (Sec-  
ond Term)

Nutrition  
Bacteriology  
Principles of Public Health Nursing and  
Administration (First Term)  
The Health Education Movement (First  
Term)  
Physical Education Methods

*Western Reserve University, Cleveland,  
O.*

June 23–August 1  
Personal Hygiene  
Theory and Practice of Physical Education  
for the Elementary School  
Principles of Health Education  
Health Education Methods

*University of West Virginia, Morgan-  
town, W. Va.*

June 6–July 18  
Hygiene and Sanitation

*University of Wisconsin, Madison, Wis.*

June 30–August 8  
Junior Red Cross and First Aid to the In-  
jured  
Tests and Measurements in Physical Edu-  
cation  
Supervision and Organization of Health  
Education  
Bacteriology

Cormack, *Secretary*, Dr. G. S. Coon, Dr. Benjamin B. Keys, Dr. Carl J. Johnson, Dr. J. W. Stovall, Dr. F. L. Johnson, Dr. Addison Dimmitt, Dr. L. T. Minish.

#### RESEARCH FELLOWSHIPS

THE National Tuberculosis Association announces a limited number of fellowships in social research as related to tuberculosis, open to graduate students who have had special training in statistics, social science or public health. Preference will be given to candidates who are interested in pursuing research in public health after the completion of this fellowship.

The fellowship grants will date from the beginning of the academic year in the fall of 1930. They are for a twelve-

month period and the fellowship grant amounts to \$1,500 for that period with a month's leave for vacation.

Interested candidates should write to Jessamine S. Whitney, Statistician, National Tuberculosis Association, 370 Seventh Avenue, New York, N. Y., for further information.

#### DR. WELCH HONORED

**D**R. William Henry Welch, professor at Johns Hopkins University and known as the "Dean of American Medicine," was honored by the medical profession on his 80th birthday, April 8. Many of his friends and former students met in Washington where a celebration was held. A portrait of Dr. Welch was painted by Alfred Hutty especially for this occasion. A souvenir volume will be published containing an account of the celebration. He was president of the American Social Hygiene Association in 1917, and is now honorary president and chairman of the General Advisory Committee of that association.

#### MR. DINWIDDIE IN NEW YORK HEALTH DEPARTMENT

**C**COURTENAY Dinwiddie has accepted an appointment as Consultant to the New York City Department of Health, for the current year, for the purpose of making a study of conditions and needs in the child hygiene field.

#### DELTA OMEGA

**L**ECTURES under the auspices of local chapters of Delta Omega, the honorary public health society, were given in March at the Massachusetts Institute of Technology and the Yale School of Medicine. At the third annual Delta Omega lecture at the Massa-

chusetts Institute of Technology on March 4, 1930, C. C. Young, Ph.D., Dr.P.H., of the Michigan State Department of Health, national president of the society, spoke on "The Trend in the Development of Public Health Laboratories." The speaker at the Yale School of Medicine on March 14, 1930, was George H. Bigelow, M.D., Dr.P.H., State Commissioner of Public Health of Massachusetts, who discussed the official program for cancer control in his state.

#### DEATH OF HENRY ALBERT

**H**ENRY Albert, M.D., F.A.P.H.A., Health Commissioner of Des Moines, Ia., died on April 7, from a heart attack following an operation for appendicitis.

Dr. Albert was chief of the pathology and bacteriology department of the University of Iowa, and later director of the State Hygienic Laboratory, before becoming Health Commissioner in 1926. He was 52 years old.

#### SCARLET FEVER CASE

**T**HE long expected suit for patent infringement by Dr. George Dick and Dr. Gladys Dick of Chicago, vs. the Lederle Antitoxin Laboratory of Pearl River, N. Y., is being heard in U. S. District Court for the Southern District of New York, by Judge Caffey (April 16). The Dicks are suing for patent infringement, claiming infringement on 7 of the 10 patent claims. The defense maintains that the patent for Scarlet Fever Toxin and Antitoxin is invalid because of lack of originality, and being developed from prior art. The case will be heard for the next 10 days or 2 weeks, experts being called from all parts of the country to testify both for the plaintiff and the defense.

## PERSONALS

PAUL B. BROOKS, M.D., Deputy Commissioner of Health of New York State, has been reappointed to that position by Dr. Parran, Health Commissioner of the state.

DR. TALIAFERRO CLARK has been appointed to the position of Chief of the Division of Venereal Diseases of the U. S. Public Health Service, by Surgeon General Cumming. This position was left vacant by Dr. Thomas Parran who is the new Health Commissioner of New York State.

DR. ANDREW WEBSTER VAN SLYKE of Coxsackie, N. Y., has been the Health Officer of Coxsackie for fifty consecutive years.

GRACE GEORGE was recently appointed to supervise the health education work of the division of child hygiene of the Illinois State Department of Public Health.

DR. ALBERT CRUM BAXTER of Springfield, Ill., was appointed by the Governor to the position of assistant director of the State Department of Health.

THOMAS G. HULL, PH.D., Chief of the Division of Laboratories of the Illinois State Department of Health, has joined the staff of the American Medical Association in Chicago, leaving the State Department on April 1, 1930.

SURGEON GENERAL H. S. CUMMING of the U. S. Public Health Service, Director of the Pan American Sanitary Bureau, was recently made an honorary member of the National Academy of Medicine of Mexico, located in Mexico City.

In October, 1927, Dr. Cumming received a similar honor from the National Academy of Medicine of Peru, and he has lately been made an officer of the Order of Finlay, of Cuba.

## CONFERENCES

May 7-10, National Tuberculosis Association, Memphis, Tenn.

June 2, week of, American Water Works Association, St. Louis, Mo.

June 6-14, National Conference of Social Work, Boston, Mass.

June 12-14, Western Branch of American Public Health Association, Salt Lake City, Utah

June 18-19, State and Provincial Health Authorities of North America, Washington, D. C.

June 20-21, Conference of the Surgeon General, Washington, D. C.

## FOREIGN

June 21-28, Royal Sanitary Institute, 41st Congress and Health Exhibition, Margate, England

Aug. 3-9, Second International Congress for Sex Research, London, England

Aug. 4-9, International Veterinary Congress, London, England

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# American Journal of Public Health

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Volume XX

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## Cancer Death Rates, Smoke and Topography

JEROME MEYERS, M. D.

*Department of Health, New York, N. Y.*

THE purpose of this paper is to draw more intensive attention of vital statisticians, of city, county, state and federal health agencies, and of other organizations concentrating on cancer problems to the possibilities for research in the variations in cancer mortality statistics, and to urge a wide, national study of such on the lines of the program here given. Clinical, experimental and post-mortem investigations of cancer have proceeded for decades; at times medical investigation needs a new and different approach to overcome a certain transmitted inertia, a new *point d'appui*. It is not claimed that smoke accounts for all cases of cancer; it is probably one of many causes, or one manifestation through biochemical irritation of some great underlying cause that is as yet beyond our ken. But who knows, if we can touch the fringe of the problem, that we shall not through some clue obtained penetrate the veil? No one man can easily take upon himself the burden of such cancer study as outlined. It is the work of a body of expert topographical engineers, meteorologists, chemists and biochemists, sanitary inspectors, field workers, and medical men.

That cancer death rates vary greatly in different countries is fairly well recognized. They will of course naturally be higher in populations containing a large proportion of persons in the older age groups, for the disease is one which affects chiefly those over 50 years of age. For this reason, in any study of cancer prevalence it is insufficient to deal with crude death rates; it is necessary to adjust the rates for the age and sex composition of the population. Even when this is done, however, considerable variations are discovered. It is usually not appreciated that the adjusted rates differ materially in the different



states in this country, and that they often vary widely in contiguous cities or parts of cities.

In 1920 the adjusted cancer death rates<sup>1</sup> (age and sex allowed for) for the 4 states in the country with the highest rates: Massachusetts, 97.9 per 100,000; Connecticut, 92.9; New York, 92.5; Minnesota, 92.1; show a considerable divergence from the 4 states having the lowest rates: Tennessee, 51.6; North Carolina, 49.7; Mississippi, 48.0; and South Carolina, 45.8. The refined rates (adjusted for age, sex, and residence of the deceased) for cities for 1924 show very marked differences not only between different cities in the country, but between cities in the same state, and even between nearby cities.<sup>2</sup> San Francisco has a rate of 133.1; New York City, 121.4; Albany, 107.2; and San Antonio, 73.0. Two adjacent cities are Minneapolis and St. Paul; the former's rate is 98.1, the latter's 120.9. The rate of San Francisco is 133.1, that of nearby Oakland is 92.7. The rates of the different boroughs of New York City are: Manhattan, 145.7; Bronx, 124.2; Brooklyn, 104.3; Queens, 106.7; and Richmond, 106.4. What are the importance and meaning of such variations in the complex etiology of cancer?

C. E. Green,<sup>3</sup> as a result of investigations in Scotland and England, showed some marked differences in the death rate from cancer even in comparatively small areas. In Scotland he found rates running from 17.6 per 100,000 in Kinsing Park, a suburb of Glasgow, to 97.3 in the rural districts of Nairnshire. In London he states the rate is 1-7 for all deaths in the Strand district, while, in Stepney, it is only 1-54. He also found that in the County of Nairn, where there was the highest death rate, there was one area of 100 square miles with 1,000 inhabitants where he could obtain the record of only 1 case of cancer, a rodent ulcer. He further points out that the rate in the Orkney Islands was generally low, but that three islands, where peat approaching the composition of coal was used, showed a high rate. He also calls attention to the known facts that epithelioma is very prevalent among chimney sweeps who show the highest rate for any occupation, also among gardeners or farmers who use soot, and that cancer is known to be frequent among workers in aniline dyes, paraffine, and gas pitch, brewers and metal workers who use sulphuric acid. His theories as to the causes of the variations in cancer death rates are:

1. Where the death rate is low we have a low or high area comparatively flat or at most with low swelling undulatory hills with houses built on the sides, whereas those sections with a high mortality are intersected by gulleys or valleys with houses in the hollows, or the whole section is in the hollow or cup or depression surrounded by higher land.

2. The excessive presence of  $\text{SO}_2$  gas from the use of coal with a high sulphur

content was present with the highest incidence of cancer. In all the Orkney Islands except three the death rate is very low. Peat is used in all the islands. In the three islands with high rates, it was found on analysis that the peat used had 0.75 or more sulphur, approaching the sulphur content of coal.

3. Uneven roof-lines such as we find in the Strand district with its death rate of 1-7 cause poor house or chimney ventilation with an increase of  $\text{SO}_2$  while a level roof-line as in Stepney with a rate of 1-54 affords opportunity for excellent ventilation with little accumulation of  $\text{SO}_2$ .

Additional data to support Green's theory of the relation of combustion products to cancer are found in his article<sup>4</sup> published in 1915. They are based on maps by J. Bertillon,<sup>5</sup> who states that, if a line be drawn from La Rochelle to St. Etienne and from there to the Rhone, the Pyrenees and the seas, the area does not contain a single department where cancer is frequent, whereas, in every department inside a square made, having the sea on the west and lines from Caen to Angers, Angers to Dijon, Dijon to Mézières, cancer is highly prevalent, the death rate per 100,000 being four or five times as great as that in the square territory in the south. Each square comprises about one-third of France.

Bertillon confessed that he could give no adequate explanation of the great differences in these cancer death rates. Green then sent a questionnaire to the prefect of each of the departments of France, asking information as to the form of fuel used in his territory. He found that in the northern square or area, where the rates were high, coal was used, while in the southern area wood was burned. Even in the north in Brittany the rates were low and here wood was used. Green concludes:

Some other element than strictly sulphur content may be involved in the relationship of certain fuels to cancer death rates of the districts in which they are used. Some chemical condition of the fuel, its ash, or its other products of combustion, may be responsible.

It should be noted that by smoke is meant not only the contained solids such as tar and carbon, but the invisible gases also. The amount of tar in smoke is indicated by estimates that 500,000 tons of tar are released yearly above England by the combustion of coal. The production of cancer by the application of coal-tar to the skin of rabbits and mice by Yamagiwa and Ichibawa, and a long line of other workers needs no amplification. Passey and Carter-Braine<sup>6</sup> have succeeded in producing epithelioma in white mice with an ether soluble product of soot from a bituminous coal. Kennaway,<sup>7</sup> working on the relation of coal and oil combustion products to cancer, summarized his work on gas-works tar by stating that the industrial evidence, supplemented by the experimental also, shows that the cancer producing

substance is present in the higher boiling fractions; namely, creosote oil, anthracene oil and pitch; and hence may distil over through an interval of temperature extending roughly from 250 to 500° C. He concludes his work on cancer produced by gas-works tar, lignite tar and shale oil:

Thus the attempts made as yet to find the cancer producing substance among the well known constituents of coal-tar have given wholly negative results. It is not unlikely that this substance is a compound, as yet unknown, which is unstable and present in amounts so small as those of the vitamins in foods; as in the case of some hormones its identification may be long delayed even when very concentrated preparations may be obtained.

Most interesting are certain figures recently published by the registrar general<sup>8</sup> of England. They show a possible relation between cancer and certain occupations and fumes from fuel combustion. For the decennium ending 1927, the 3 occupations showing the greatest incidence of cancer of all sites were (1) the china kiln and oven men, (2) the puddlers, and (3) the gas stokers. Particular attention must be drawn to the fact that all of these workers are exposed to gases and fumes. In the work of cotton spinners who rank fifth in frequency of cancer, shale oil (shale is a low form of coal), regarded as the most dangerous of all oils in its cancerogenic properties, is used.

Based on Green's theory of smoke and topography, a survey<sup>9</sup> of the Borough of Richmond, or Staten Island, one of the five boroughs of the City of New York, was begun by the writer in 1920 under the New York City Department of Health, Bureau of Industrial Hygiene, and was published in abridged form in 1928 by the department.<sup>10</sup> Staten Island,  $13\frac{1}{2} \times 7\frac{3}{4}$  miles, is peculiarly adapted to such an investigation, as it presents varied hilly and level areas, and part of its northerly shore, separated only by the comparatively narrow Kill van Kull from Constable Hook, Bayonne, and Bergen Point, N. J., has been exposed for many years to the smoke and fumes from manifold chimneys and stacks of at least twenty-five great industrial, metal refining, chemical, and oil refining plants. The island was divided into 13 districts, and each intensively studied for the factors of smoke from industrial plants and dwellings, topography, meteorology, racial composition, age, and sex. The refined cancer death rate average for the years 1914-1920 inclusive was calculated for each district. Only cases resident at least 3 years before death were included. This is the first time in any cancer study that the time factor and locality were taken into consideration in the possible etiology. No cases in institutions for the aged were included. Proper allocation was made for all other borough deaths.

The corrected weighted average annual death rate varied from 42.1 to 78.9 per 100,000. The probable error for each district, estimated by Arne Fisher, showed their reliability. The following conclusions were drawn:

1. There is a marked and interesting variation in cancer death rates in different countries, within countries and states, and probably even in different sections of cities.

2. On Staten Island, individual or parent nativity does not alter our corrected death rates. In mixed populations, differences in cancer death rates among Irish, German, English, Italian, and natives tend to neutralize each other. Diet also was found of no great moment.

3. On Staten Island there may be an etiological relation between the incidence of cancer and topography, open level districts, of high or low altitude, showing lower cancer rates than land in hollows or depressions or intersected by gullies, valleys or lying against adjacent hills. Albany and San Francisco should make interesting studies.

4. There may be an etiological relation between the combustion products of coal and oil and cancer. Those sections of Staten Island exposed to smoke, fumes, and gases show a higher cancer death rate than those not so exposed. House-heating and chimney ventilation are also important, as gases and fumes from these sources may bear a relation to cancer incidence as found in our districts.

5. The better combustion of fuels in industry and homes, or absorption of gases, smoke and fumes to avoid atmospheric or room contamination, may mean less cancer.

6. Whatever may be the possible errors in this study of a comparatively small number of cases (515), it cannot fail to show even on an island  $13\frac{1}{2} \times 7\frac{3}{4}$  miles, divided into 13 districts, variations in cancer death rates, and these variations would seem in the light of our findings to bear a relation to etiological factors of fuel and topography. These conditions therefore would seem to be a part of the complex etiology of cancer.

Along the lines of the above study, I have been investigating three sections of Manhattan, each comprising 6 sanitary districts, one on the lower east side, one on the lower west side, and one along Central Park West. In the first two are largely old tenements with room heating by stoves, in the third, high class private houses, apartment houses, and hotels with central heating by steam or water. A period of at least 5 years will be covered and will include no case that has not been resident at least 3 years before death. Final figures for population must wait for the 1930 census.

There is available at present more than one such problem crying for study and elucidation. To refer again to the refined cancer death rates given for 1924—why has St. Paul a rate of 120.9 and Minneapolis one of 98.1? Here are two contiguous cities, apparently with a similar racial composition, where medical facilities for diagnosis and consultations cannot greatly differ, with a variation in rate that is

striking. Recently the writer, while in Minneapolis at the cancer program of the American Public Health Association, made a crude topographical survey of these two cities. It was noted that Minneapolis is very flat while parts of St. Paul are distinctly hilly with other sections directly under the hills. Can smoke and fumes and gases from industries and homes and topography play a part? Attention is called to the rates of Oakland and San Francisco; the former, 92.7, the latter, 133.1. Why? Is it because San Francisco is exceedingly hilly or Oakland flat? Are there racial differences?

Hoffman's recent work on San Francisco<sup>11</sup> shows not only high general cancer rates but also high rates for cancer of separate organs, as compared with general United States rates. Why? In New York State the rates vary from 121.4 for New York City, with 145.7 for the Borough of Manhattan, to 98.2 for Syracuse. Albany, with a rate of 107.2, practically all hills and depressions and lying in a great cup or depression and exposed to much smoke, offers an ideal city for cancer study in relation to smoke and topography. Why are the rates in New Jersey—Jersey City 129.7, Paterson 110.9, Trenton 100.1, Newark 97.8, and Camden 86.5? Why are they in Texas—Houston 92.9, Dallas 84.7, and San Antonio 73.0? Why in Houston is the rate for colored 69.0 while in Dallas it is 114.3? Why in Connecticut is New Haven 115.1 and Hartford 96.2? New Haven and Syracuse each has medical colleges; the first has a rate of 115.1, the second 98.2. Why in Missouri is the rate for St. Louis 107.4, while that of Kansas City is 91.1? Why in Pennsylvania are the rates—Philadelphia 108.6, Pittsburgh 106.1, Reading 90.1? There must be some explanation other than the factors of age, sex and allocation already considered.

As was pointed out in Staten Island, even after a study by such writers as Hoffman,<sup>12</sup> Willcox,<sup>13</sup> H. G. Wells,<sup>14</sup> and H. Green,<sup>15</sup> it would seem that even with due allowance for better diagnosis, better vital statistics, concentration of physicians, and increased longevity, there remain other factors to be considered. Even if one half of the increase of cancer deaths is explainable by the above factors, still in this half the question of environmental conditions as topography and smoke may be of importance. The other half of the increase, concerning which Willcox after exhaustive analysis is not certain, would also be affected by such factors. And even if the entire increase was thus explained, it would not mean that environmental and racial factors did not cause cancer death rate variations. It would seem that the number of doctors, diagnoses, vital statistics, and longevity should not be so diverse in these cities within one state. In fact, H. Green<sup>15</sup> states that the unsatisfactory correlation of the number of physicians

to the cancer death rates of the cities he studied can be explained by the fact that there are sufficient physicians in each of these cities.

It is only along the lines of the Staten Island study, taking into account age groups, the elimination of non-resident deaths, topography, and housing and industrial conditions, that any final conclusions would be warranted.

It would seem that a closer and truer view of cancer factors can be obtained from a study of a small compact area divisible into districts than from a consideration of states or countries. In a borough such as Staten Island, divided into contiguous districts in which we can study comparative cancer death rates, there cannot be great differences in medical and surgical diagnosis, or in reporting cancer deaths. Moreover, in such an area the physicians and surgeons see and diagnose patients from various districts. H. G. Wells<sup>14</sup> stresses the pitfalls of cancer diagnosis and statistics but finally says:

At present, it seems to me, the most that we can say is that although all races and groups of human beings are susceptible to cancer, it is probable that conditions of life and hereditary constitutional factors modify the frequency with which cancer appears in different races and different nationalities or the frequency with which it attacks different organs and tissues.

Lombard and Deering<sup>15</sup> have recently published a study of cancer mortality in nativity groups which should point the way for similar studies by health organizations. They report, among other findings, that the foreign born in Massachusetts have sufficiently good diagnosis to eliminate that factor in discussing the high cancer death rate in their case. Such important studies are but a part of the scheme of cancer investigation entailed in a comprehensive cancer survey.

A plan for such a survey is as follows:

1. Division into topographical districts of a city or adjacent cities by a topographical engineer with preparation of maps
2. Listing by districts, street and number all cancer deaths resident at least 3 years before death, and proper allocation to and from the districts with elimination of all non-resident deaths and all institutional deaths
3. Meteorological study of the prevalence and direction of winds and barometric conditions
4. Study of atmospheric contamination by the combustion products of coal, oil or wood:
  - a. From industrial plants
  - b. From domestic houses using (1) coal stoves, (2) wood stoves, (3) central heating, hot air, hot water, steam, (4) oil furnaces
5. Study of coal, wood and oil consumption
6. Study of occupation of deceased
7. Study of nativity and nationality
8. Study of diet

9. Density of population
10. Blood studies, reaction, composition
11. Study of chemical and possibly radioactive constituents of smoke
12. Refined cancer death rate in each district and probable error
13. Discussion of all factors and conclusions

## SUMMARY

1. There is a variation in cancer death rates between countries, states, cities, even adjacent, and very probably between parts of cities.

2. Green's work in England and Scotland and Bertillon's figures for France would seem to point to a distinct influence of topography and of combustion products of fuel on cancer death rates.

3. The Staten Island cancer study along the lines of Green's theories, but allowing for age, sex, nativity, nationality, diet, allocation, exclusion of institutional deaths, and a 3-year period of residence before death, points to a relationship between smoke and fumes from industrial plants and homes and topography and cancer prevalence.

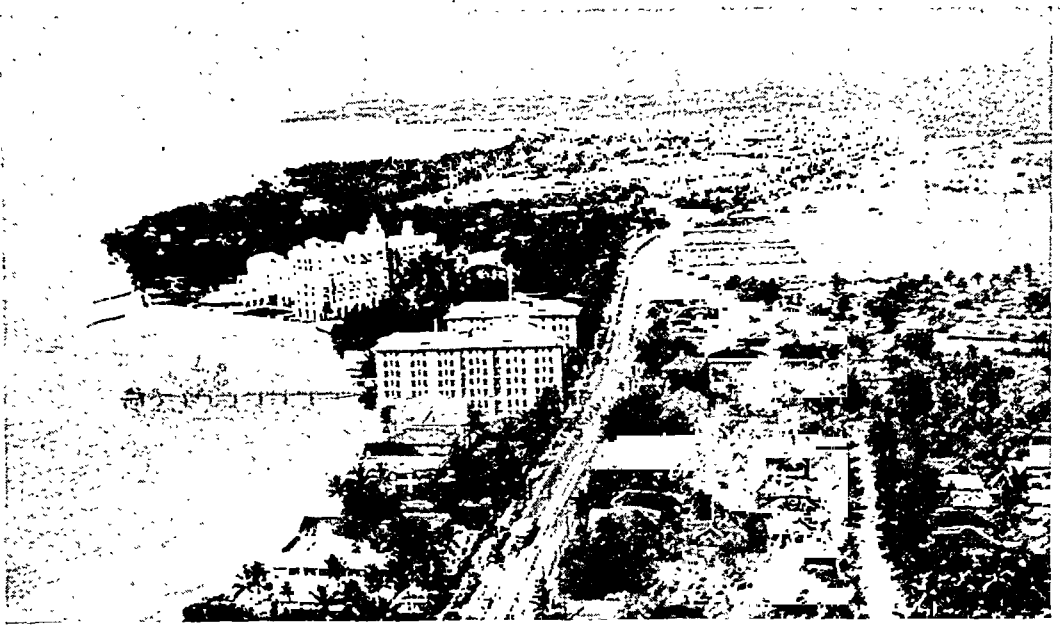
4. Other statistical, chemical, and experimental data point to the influence of smoke and fumes or tar on cancer. What the action and nature of a cancerogenic factor liberated by combustion are is not certain. Whether such factor is chemical or possibly radioactive in nature is material for other studies.

5. Further studies like the Staten Island investigation should be made by city, county, state or national health bodies, or cancer organizations. This means a corps of experts in a number of fields. The burden of such a study is too great for a single worker.

6. Further studies are now indicated and offer a rich field for an advance in the knowledge of the etiology of cancer in the case of (1) Minneapolis and St. Paul, (2) San Francisco and Oakland, (3) Albany, N. Y.

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WAIKIKI BEACH, HONOLULU

# Health and Welfare in Honolulu, Hawaii

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**H**ONOLULU, located on the island of Oahu, is the principal city and seaport of the Territory of Hawaii. The islands making up the Territory\* abound in natural beauty, human resources, and unusual and fascinating phenomena, and are often called the "Paradise of the Pacific." They are of volcanic origin with minor coral additions. Oahu's volcanoes are all extinct. These islands lie more than 2,200 miles from their nearest land neighbor, California, 3,400 miles from Japan, and 4,410 miles from Australia. The land area of the islands covers 6,454 square miles, while the island of Oahu occupies 598 square miles and the city of Honolulu 25 square miles.

Honolulu has a subtropical climate, with even temperature (average 74.7° F., with extremes of 60° to 85° F.) and more than the usual sunshine, providing life out of doors throughout the year. The atmosphere is less humid in the morning than in the evening. Averages of the yearly mean for 24 years showed readings in relative humidity at 8 A.M. of 68 per cent, and at 8 P.M. of 71 per cent. The city rainfall varies from an average of about 20 inches per annum at

\* The islands most highly developed are Hawaii, Maui, Kahoolawe, Lanai, Molokai, Oahu, Kauai, and Niihau.



Waikiki and along the harbor front to about 150 inches in the upper Manoa and Nuuanu valleys, so that one may enjoy either a wet or a dry climate without leaving the city.

Honolulu is a modern American city of medium size. The population\* (113,000 in 1928) is greatly diversified as to race, the Hawaiian and Oriental groups figuring prominently. The Territory of Hawaii, on its own petition, entered the American Union in 1900, having for some three-quarters of a century previously experienced the influence of American education, religion, and commercial practice. All immigration laws of the United States are therefore applicable in Hawaii, which has become a "melting pot" of races and nationalities, with relative freedom from racial prejudice.

Honolulu is an educational center for the Territory, being the seat of the University of Hawaii, the normal school, Punahou School, and other important institutions. Hawaii is of strategic importance from a military and naval standpoint† as well as for political and commercial reasons. Cane sugar and pineapples are the main products, although coffee also figures prominently as an export. The tourist business is developing rapidly with improved steamship facilities in the Pacific.

In 1927, there were 98,800 employees and their families living in houses provided by 42 plantations, accounting for nearly one-third of the population of the islands. A total of \$659,800 was expended that year by the plantations for new dwellings, \$653,629 for rehabilitation, and \$795,392 for medical, nursing and sanitation services. Several plantations have modern and fully equipped hospitals, including dispensary and visiting nurse services. The chiefs of the medical services are also local representatives of the Board of Health. The pineapple canning factories likewise maintain modern dispensaries, medical and nursing services.

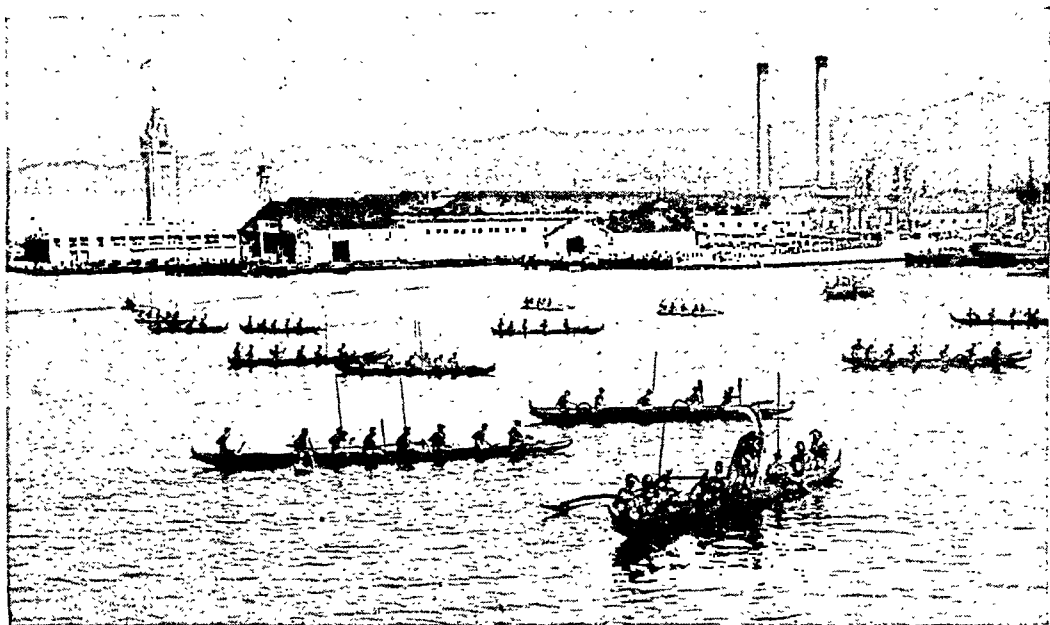
#### PUBLIC HEALTH

Responsibility for public health work in the city and county of Honolulu is divided between the Territorial Board of Health and the City and County Board of Supervisors. Certain activities, such as much of the public health nursing, dental treatment and child hygiene, as well as clinics and recreation, are carried on at Palama Settlement,‡ while the Department of Public Instruction is largely responsible for

\* Population of entire Territory in 1928, 348,767; population of Oahu, 180,000.

† On the island of Oahu are several important Army posts, including Schofield barracks, the largest Army unit in the United States, and an important Navy station at Pearl Harbor, adapted for expansion as needs arise.

‡ Chiefly supported by the United Welfare Fund, the City and County, the Chamber of Commerce, and by endowment, including the Strong Foundation (dental treatment).

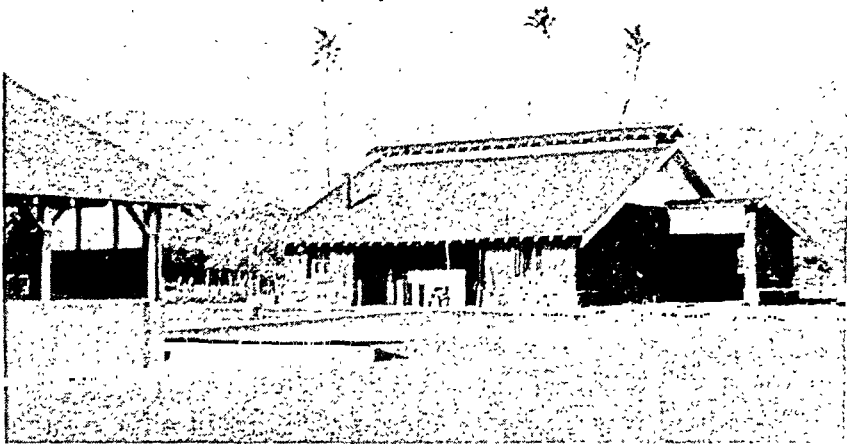


OUTRIGGER CANOES, HONOLULU HARBOR

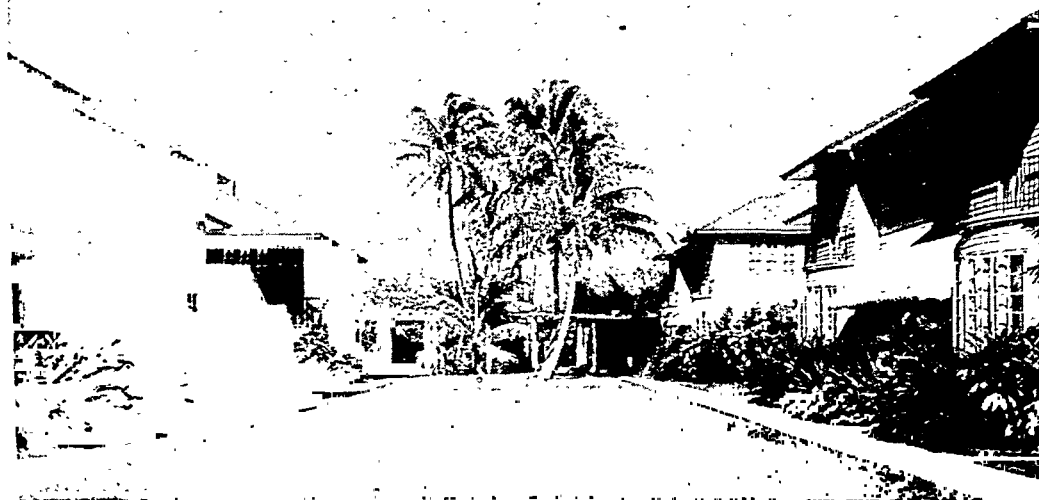
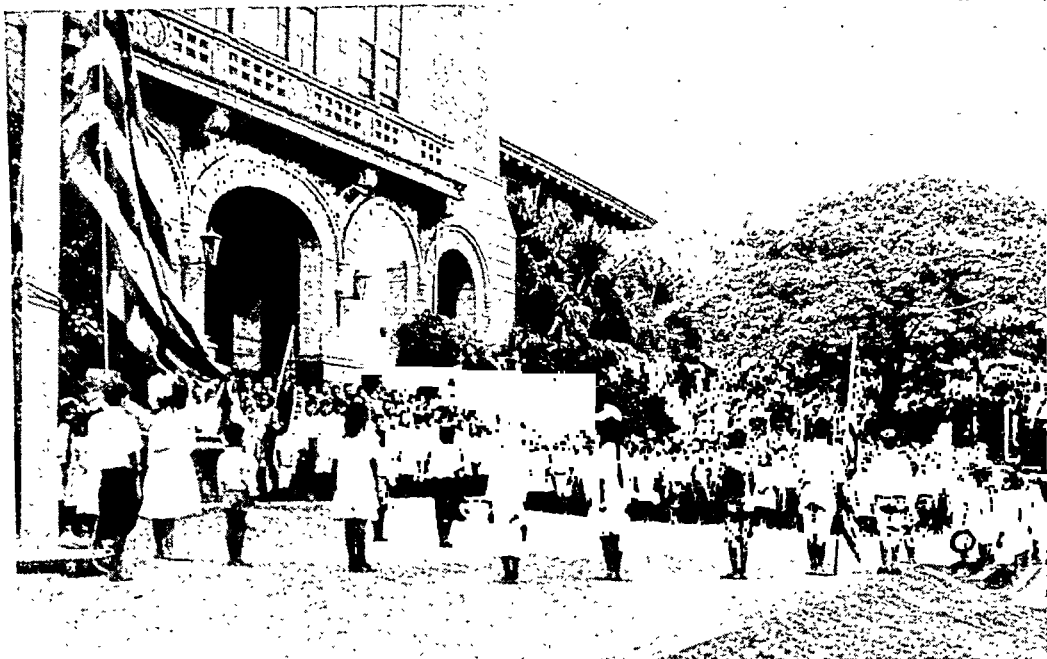
dental hygiene and nutrition work among grade school children. Voluntary agencies engaged in special activities of a public health nature include, besides Palama Settlement, the Free Kindergarten Association, the Junior League, the Parent-Teacher Association and various welfare agencies. The Chamber of Commerce has a public health committee and is building up a reserve fund of \$250,000 for use in the event of an epidemic. The United Welfare Fund raises \$450,000 each year for the work of welfare agencies; and a part of this amount is allocated for health work and the care of indigent sick, exclusive of hospitalization.

The Territorial Board of Health, unlike most state boards of health, carries the heavy responsibility of hospitalization of cases of leprosy, mental disease and tuberculosis. The funds and organization of the city and county health department are devoted almost wholly to the care of indigent sick in hospitals or homes, and are adequate to permit of only milk and food inspection work. The 1928 expenditures by all agencies, in the city of Honolulu, for public health work amounted to \$1.96 per capita, while over three times this amount was spent for the care of the sick. The total expenditures of the Board of Health in the whole territory amounted to \$1,222,288.

The physicians of the county have an active medical society which holds regular meetings and coöperates in public health activities. The society aided in the preparation of a communicable disease control code. In 1929 the County and Territorial Medical Societies actively coöperated with the Board of Health in a toxin-antitoxin immu-



TOP—PINEAPPLE FIELD, WITH U. S. NAVAL STATION, PEARL HARBOR, AT RIGHT  
 MIDDLE—DAIRY LAY-OUT, HONOLULU  
 BOTTOM—SUGAR MILL AND PLANTATION



TOP—FLAG RAISING, PUBLIC SCHOOL, HONOLULU—LOWER LEFT, HAWAIIAN FLAG  
MIDDLE—T., A. T. WORK, HONOLULU; CHILDREN'S WARD, LEAHI HOME  
BOTTOM—RESIDENTIAL SECTION, HONOLULU

nization campaign which resulted in the protection of some 90 per cent of the school children and 40 per cent of the preschool children. At the Queen's Hospital, once each week, for an hour, is held a valuable clinical-pathological conference which is regularly attended by 40 to 75 of the leading practitioners of the county. Palama Settlement, the principal voluntary health organization, has a strong medical advisory committee of which the President of the Territorial Medical Society is chairman, and the President of the Board of Health, an ex-officio member.

The collection and analysis of vital statistics are conducted by a special bureau of the Board of Health. In 1928, in Honolulu, a resident birth rate of 39.7 and a general death rate of 14.7 were recorded, with an infant mortality rate of 63.98. For rural Oahu, the infant mortality rate was 102.4. The principal causes of death were tuberculosis (222.3), pneumonia (209.5), heart disease (155.5), nephritis (126.6), cancer (91.3), and diarrhea and enteritis (87.5), while diphtheria accounted for a specific rate in the city in 1927 of 22.3, and automobile accidents for a rate of 20.5. Death rates from tuberculosis and heart disease were nearly three times as high, and from pneumonia and diarrhea and enteritis over twice as high, for the Hawaiians and Filipinos as for other race groups. The figures for broncho-pneumonia were over twice as high as those for lobar pneumonia. Deaths from non-pulmonary tuberculosis have decreased considerably since 1924, as a result of increased use of pasteurized milk and the systematic tuberculin testing of dairy herds.

It is chiefly necessary to provide a well rounded program of local control, and then to watch incoming ships to prevent the spread of communicable diseases. On the mainland, on the other hand, each state is subject to visitors from 47 other states, and adjoining countries, in addition to the ships which enter many ports. In Honolulu, the U. S. Public Health Service maintains medical officers and a quarantine station, and coöperates with the Board of Health, in this work and in the control of leprosy. Hospitalization of city cases of communicable diseases is carried out in the isolation wings of 3 general hospitals and the Children's Hospital. During 1929, some 14,000 children (approximately 4,000 under 5 years of age) received three immunizations of toxin-antitoxin. Vaccination of school children against smallpox is compulsory.

The venereal disease services in Honolulu are very limited; but one clinic is maintained. Reporting of cases is not required although the Board of Health has endeavored to secure the necessary legislation for reporting by name and address. Some education in sex hygiene

has been carried on in the high school, and in Kamehameha school for Hawaiian children.

The tuberculosis service is primarily a responsibility of the Board of Health, through a separate bureau with a full-time director, and its division of public health nursing. Sanatorium facilities are provided at Leahi Home which operates under its Board of Trustees, and receives the major portion of its revenue from county and territorial subsidy. There are 4 clinics each week in the city, with clinics once in 6 weeks in each of 7 localities of the rural area. Reporting of tuberculosis cases is fairly satisfactory. Last year there were 420 patients registered in the city at clinic for diagnosis, who made 3,406 visits, and this service is increasing under capable supervision. Emphasis is given to contact cases and practical use is made of X-ray facilities through a coöperative arrangement between the Board of Health and Palama Settlement. The greatest weaknesses are in the lack of preventorium facilities\* and of sufficient nursing personnel. The Palama Fresh Air Camp cared for 153 undernourished children for 5 weeks each during the summer of 1928.

The Board of Health has a Bureau of Leprosy with a medical staff, and operates the Kalaupapa Settlement on Molokai, Kalihi hospital which is a receiving station on Oahu, the Kapiolani Girls' Home, and the Kalihi Boys' Home for non-leprous children of parents who have the disease. On Oahu there were 41 cases of leprosy reported in 1928, while 44 cases were reported in the territory with 51 deaths.

During 1928 in Honolulu there were 4,496 live births to resident mothers. Of this number, 649 occurred in hospitals, 427 in maternity homes, 710 in homes attended by physicians, 1,431 (chiefly Japanese) in homes attended by midwives, and 1,414 (chiefly Japanese, Hawaiian and Chinese) in homes attended by "others," such as friends or members of the family. Palama Settlement has 3 prenatal and 12 well baby conferences, and maintains a nursing service for prenatal, obstetrical, infant and preschool child care. Excellent progress is being made in infant welfare work in the city, although the intensity of nursing service falls somewhat below the desired standard. In the rural districts, the Board of Health holds regular child hygiene conferences in coöperation with the plantations.

Honolulu has 39 public schools, including a normal school, a high school, 6 junior high schools, a school for the deaf and blind, a vocational school, and an opportunity school. In addition there are 42 private and parochial schools, including the kindergartens. The en-

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\* Provision has been made for the opening of a preventorium at Palama Settlement in July, 1930, through the coöperation of Palama, Leahi Home, the College Club, and other agencies.

tire school registration totals 28,632 in public schools, and 8,285 in private and parochial schools.

The responsibility for school health supervision rests with the Board of Health and the Department of Public Instruction, the former providing medical and nursing care, and the latter dental hygiene, nutrition and physical education. Dental treatment of school children of needy parents is provided at Palama Settlement by the Strong Foundation where 5 full-time dentists are employed. A joint school health committee has recently been formed, made up of representatives of the Board of Health and the Department of Public Instruction.

Public health nursing was originally supplied by Palama Settlement, the first nurse having been secured in 1906. Now the Board of Health employs, for work in Honolulu, 7 nurses, and Palama Settlement employs 22 nurses. There is a ratio of 1 visiting nurse to approximately 4,300 persons. Recognizing the need for economic service and the importance of emphasis on the problems of the family as a whole, the nursing personnel of these two organizations has recently been pooled on a generalized district basis. The director of the Board of Health nurses is the supervisor of field work, and the director of the Palama nurses is chiefly responsible for administration. Heretofore, the Palama nurses did prenatal, obstetrical, infant, pre-school, and bedside nursing, while the Board of Health nurses did school and tuberculosis nursing. A teaching center for public health nurses has been established at Palama.

All of the milk sold in the city is from tuberculin tested herds, and 65 per cent is pasteurized. Retail dairy farms (41) are inspected twice a month and pasteurizing plants (3) monthly or oftener. At present food and milk establishments are supervised both by the City and County and by the Territorial Board of Health, but it is anticipated that this work will soon be turned over to the latter body. Sanitation work is a function of a Bureau of Public Health Engineering of the Board of Health.

Diagnostic work in the city is handled through the Board of Health in a private laboratory, while food and water analyses are made in separate laboratories maintained in the Bureaus of Pure Food and Drugs and of Engineering. In addition, much diagnostic work is done in the hospital and clinic laboratories of the city.

Honolulu has demonstrated its understanding of modern welfare work. It is gratifying to note the high standard of effectiveness which characterizes the work of the United Welfare Fund, the Council of Social Agencies, the Central Child Placement Committee, and of many

welfare agencies in the city. It is believed that there has never been a more sincere and more careful effort sympathetically to serve a community need than is being exerted by the welfare agencies.

A comprehensive health and welfare survey of Honolulu was made in 1929 by the Committee on Administrative Practice of the American Public Health Association, under the auspices of the United Welfare Fund and the Territory of Hawaii. A strong advisory committee of the United Welfare Fund, including representatives of the medical society, is now studying the recommendations.\* The Governor of the Territory has also appointed an advisory committee on Public Health to review the findings. One of the most important recommendations of the survey is that a plan be developed whereby all the public health work of an official nature in the city and county be carried on by the Territorial Board of Health, with a full-time, experienced medical health officer serving as deputy health commissioner of the Territorial Board, but in charge of the work in the city and county of Honolulu. Other urgent needs are for full-time trained medical directors of communicable disease control, child hygiene, and health education and for additional public health nurses.

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\* The report was submitted in October, 1929. By February, 1930, 15 of the 121 recommendations had been carried out and 21 others had been partially fulfilled. The follow-up on this survey by local authorities is a notable record of achievement.



GROUP OF CHILDREN, LEAHI HOME



# Hydrogen Sulphide in Industry Occurrence, Effects, and Treatment\*

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MOST persons who have worked in a chemical laboratory think of hydrogen sulphide ( $H_2S$ ) as merely a chemical reagent, offensive to the sense of smell when first encountered, later tolerable, and finally (as one would judge from the odor of laboratories) delightful to some chemists. No chemistry student and few instructors consider hydrogen sulphide to be particularly harmful. The reason for this is perhaps the neglect of authors of textbooks to stress the toxic properties of the gas, and usually, though not always, to uneventful experience with the gas when used in small quantities under good ventilation.

The knowledge that hydrogen sulphide is very poisonous is not recent. Details of poisoning by hydrogen sulphide reported<sup>1</sup> in 1785 are in good agreement with modern descriptions of this type of accident. The toxicology of hydrogen sulphide has likewise been known for a long time. Prompted no doubt by the occurrences of poisoning, investigations<sup>2,3</sup> were reported in 1806 and 1827; these major findings are also in good practical agreement with the present accepted data.<sup>4,5,6,7</sup>

The lack of general familiarity with hydrogen sulphide poisoning among industrial surgeons in this country has been due to the fact that until 10 or 15 years ago cases of poisoning were rather unusual and did not constitute a major industrial health hazard. Since then, hydrogen sulphide poisoning has become a major hazard in certain industries, and has not only demanded the attention of industrial surgeons interested in promoting health and safety, but also the attention of engineers planning industrial projects in which the gas might be encountered, because experience has shown that its presence can readily impede progress and increase costs.

Briefly, the principal sources of hydrogen sulphide of importance from the viewpoint of health are: Gypsum mines, sulphur mines and

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wells, caissons and tunnels, natural gas, production and refining high-sulphur petroleum, sewers and other places where organic matter decomposes in confined spaces, blasting with black powder and other explosives in heavy sulphide ore, gas manufacture and low-temperature carbonization of coal, manufacture of chemicals, dyes, and pigments. In addition it is present in the water of some mineral springs, in rock fissure gases, volcanic gases, and arises from bacterial action in brackish waters. Some of these are associated with those previously mentioned.

The gas may be liberated direct from the original source or place where it is generated, or, due to its solubility in water and oil, may be transported great distances, then escape and create dangerous atmospheres at unsuspected places. Crude oil charged with hydrogen sulphide will tend to give off the gas from the time it leaves the well until it is refined. Waste water that has been in contact with hydrogen sulphide, as in petroleum refining and the production of sulphur from wells, will transport it to accessible places, or to the air of drains, sewers or other confined spaces from which it may find its way to places frequented by persons. In mines, tunnels, and caissons, its presence may be due entirely to the inflow of hydrogen sulphide bearing water from which it escapes into the air.

Hydrogen sulphide is not always a health hazard in all the occurrences mentioned, but has been found frequently enough to make it worthy of consideration when investigating injury or accident from exposure to gas, and in the designing of industrial and engineering equipment and projects where there is potential exposure. If consideration is not given, undue trouble and expense or even failure of the project may result.

*Petroleum Industry*—The most important occurrences of hydrogen sulphide poisoning are in the petroleum industry.<sup>5, 8, 9</sup> They came as a concomitant of light Mexican petroleum, a type of crude oil which had a markedly higher sulphur content than those previously handled. Immediately, fatal poisoning and much trouble from eye, nose, and throat irritation occurred in practically all phases of the production, handling, and refining.

The presence of hydrogen sulphide was shown by the odor, blackening of white lead paint, tarnishing of brass fixtures and silver coins, but few persons associated these with that gas. The action was thought to be too rapid and deadly for a gas so commonly known. Accordingly, the idea became general that some highly toxic gas such as hydrogen cyanide, not previously identified with petroleum and natural gas, was present in this new type of crude oil.

As it was not generally known that hydrogen sulphide is practically as toxic as hydrogen cyanide, an investigation was undertaken, which showed that hydrogen sulphide was by far the most toxic gas encountered in these products.<sup>6</sup> It was present in all places where accidents had occurred, and frequently in amounts many times greater than were necessary to cause almost instantaneous death. It was found in injurious quantities in practically every phase of the production, handling and refining of high sulphur crudes. Steam-still receiving houses and tanks containing finished gasoline were probably the only places where the possibility of hydrogen sulphide poisoning was negligible. Comparison of the physiological effects of hydrogen sulphide with cases of poisoning showed the action to be the same. No trouble was experienced when the hydrogen sulphide was removed or was absent.

Trouble from hydrogen sulphide in the petroleum industry has been markedly increased by the finding of large deposits of high-sulphur crude oil in the United States, principally in western Texas, and hydrogen sulphide poisoning now constitutes one of the major industrial hazards in this country. The gases encountered in the production of oil from certain fields contain as much as 10 to 12 per cent by volume of hydrogen sulphide, and 50 to 75 per cent has been found in refinery gases, whereas 0.005 to 0.01 per cent will cause conjunctivitis (gas eyes) after prolonged exposure, and 0.06 to 0.10 may cause almost immediate cessation of respiration, followed by death if rescue and resuscitation are not effected immediately. The difficulty of preventing accidents is further emphasized by a consideration of the magnitude of the industry, the number of persons employed, the conditions under which petroleum is produced, and the practical impossibility of preventing persons from coming in contact with the gas, either accidentally or in carrying out operations such as drilling-in, casing, making connections, gaging, and the many steps in refining, all of which present a potential exposure.

The accidents and troubles experienced recurrently are evidence of the dangers and the necessity of precaution. Men have been found dead on the open derrick floor, presumably caught by the first burst of gas when they drilled-in. During early experience with large amounts of hydrogen sulphide gas, when operations were conducted without respiratory protection, as many as 31 cases of unconsciousness were reported in closing-in one well, and in similar operations men have fallen into derrick cellars and sustained additional injury. Connection men have been overcome in ditches, and gaggers, sometimes so suddenly that they have fallen off storage tanks. Persons have

been fatally gassed by walking into ditches, ravines, and depressions in which the gas had accumulated. This danger is shown by the common occurrence of dead rabbits and birds around storage tanks, especially inside the fire walls. Men have been killed on entering tank ship compartments and storage tanks for the purpose of cleaning or repairing. At the refineries, fatal cases of poisoning have occurred at a wide variety of places. Men have been overcome while walking along a battery of batch stills; while repairing empty condenser cooling water tanks in which sewer connections were not closed; in pressure-still houses while attempting to close leaky valves; in pipe-line ditches; while gaging, and cleaning tanks.

Mild and non-fatal poisoning, in the form of conjunctivitis and moderate to severe irritation of the respiratory tract, shows the constant presence of the gas. Hundreds of these cases occur in the oil fields—in fact, some workers seem to think that gas eyes is something that goes with their particular job. Aside from discomfort and frequently intense pain, this degree of poisoning is not usually serious. There is, however, the always existing possibility of permanent impairment of vision or fatal complications from irritation of the respiratory tract. The economic feature is also important because the victims are incapacitated and require medical attention, and important development operations frequently suffer through lack of personnel.

*Caissons, Tunnels, and Mines*—The occurrence of hydrogen sulphide either as a constituent of rock-gas or dissolved in strata-water has been the cause of a great deal of trouble and a number of fatal accidents in caisson work, tunneling, and certain mining operations. The gas was encountered during the construction of the London tunnel under the Thames<sup>10</sup> and is said to have constituted an obstacle which prolonged the time of building, and probably ultimately increased the cost by many thousands of pounds. In the United States it was met with in sinking caissons off the coast of Florida where it was necessary to cease operations until means were devised for taking care of the gas, and in similar work along the Great Lakes, at Detroit and Cleveland. At the latter places it is usually associated with methane.

Except through the use of black blasting powder, hydrogen sulphide rarely occurs in significant amounts in coal mines and metal mines, although dangerous quantities may be formed in the latter by blasting in heavy sulphide ores.<sup>11, 12</sup> Dangerous amounts frequently occur in gypsum and sulphur mines.

*Decomposition of Organic Matter*—As a rule, the decomposition of organic matter, such as sewage, animal refuse, and the like, is accompanied by liberation of hydrogen sulphide, and if it escapes into

a confined space dangerous amounts will accumulate. Hydrogen sulphide poisoning from exposure to the gas in sewers has occurred repeatedly. It has been encountered at fat-rendering plants and tanneries.

*Chemical Industries*—In chemical industries, hydrogen sulphide may occur through its use as a reagent, as in the manufacture of sulphur chloride, barium carbonate, dyes, and pigments, or by its formation in processes such as are used in the manufacture of rayon.

#### TOXICOLOGY AND PHYSIOLOGICAL ACTION

Hydrogen sulphide has two apparent physiological actions—"subacute" and "acute poisoning." The former is a local inflammation caused by direct action of the gas, and perhaps some absorption products, such as sodium sulphide, on the tissues with which it comes in contact. Moist tissues such as the conjunctivae and lining of the respiratory tract are the significant sites of attack. "Acute poisoning" is the response of the nervous system to free hydrogen sulphide in the blood.<sup>13</sup> The action on the nervous system is general, but in fatal poisoning the most important response is rapid respiratory paralysis. The possibility of subacute or acute poisoning is almost wholly dependent on whether the concentration is below or above an apparent threshold concentration—estimated about 0.07 per cent by volume.

The severity of subacute poisoning increases directly with the concentration of gas and duration of exposure. A long exposure to a low concentration will produce as severe poisoning as a shorter exposure to a higher, within, of course, the range for subacute poisoning. Subacute poisoning does not terminate in acute if exposure is continued.

The small amount of gas absorbed by the blood during subacute poisoning has no apparent action on the respiration. Apparently this is due to the rapid oxidation of hydrogen sulphide in the blood to form non-toxic products, small amounts being continuously detoxicated. If, however, the capacity to detoxicate, or in other words, the threshold for acute poisoning, is but slightly exceeded, a definite response, manifested in a hyperpnea, is almost immediately produced. With continued exposure the hyperpnea soon terminates in apnea vera. These symptoms are distinctly evident in a narrow range of concentrations above those causing subacute poisoning. Respiratory paralysis occurs in a few seconds in most cases of acute poisoning in industry. There is no indication that abnormal alteration of the hemoglobin takes place, nor that the poisoning is cumulative, nor of chronic poisoning other than would be expected from repeated irritation of the eyes and respiratory passages.

*Absorption Through the Skin*—The possibility of acute poisoning by absorption of hydrogen sulphide through the skin is a moot question. Some investigators<sup>14</sup> have found that it is absorbed through the skin of guinea pigs, but in lethal amounts only when large areas are exposed to the pure gas. Others<sup>15</sup> have noted only erythema of the exposed parts after 60 minutes' exposure to pure gas. With exposure of the naked arm of man to the pure gas for 60 minutes, dark coloration of the skin, spots similar to flea bites and red mottles, followed by erythema, were observed. No action on the nervous system was noted. In testing devices for respiratory protection, the U. S. Bureau of Mines frequently conducts experiments in which the entire surface of the body of men is exposed for 30 minutes to 2 per cent hydrogen sulphide in air. No symptoms of poisoning, discomfort, or discoloration of the skin have been observed.

*Physiological Response*—The physiological response attending exposure to various concentrations by volume in air is as follows:

*0.005 to 0.010 per cent:* Subacute poisoning—Slight symptoms such as mild conjunctivitis and respiratory tract irritation after 1 hour exposure.

*0.02 to 0.03 per cent:* Subacute poisoning—Marked conjunctivitis and respiratory tract irritation after 1 hour exposure.

*0.05 to 0.07 per cent:* Subacute poisoning—Dangerous in  $\frac{1}{2}$  to 1 hour.

*0.07 to 0.10 per cent:* Possibly acute poisoning—Rapid unconsciousness, cessation of respiration, and death.

*0.10 to 0.20 per cent:* Acute poisoning—Rapid unconsciousness, cessation of respiration, and death in a few minutes.

These data are in substantial agreement with those previously cited.<sup>4, 5, 6, 7</sup>

#### SYMPTOMS, SUBACUTE POISONING

*Conjunctivitis (gas eyes)*—Cases of conjunctivitis, known in the petroleum industry as "gas eyes," range from mild to severe; if severe, the conjunctiva is swollen and markedly inflamed. The secretions are increased and a mucopurulent exudate may develop. Sometimes there is a cloudy cornea, destruction of outer cell layer, and marked blurring of vision. The eyes may itch or smart, and pain is felt on exposure to light. It is common to see persons who have been exposed to hydrogen sulphide bearing gas (sour gas) sitting under some shade with their caps drawn over their eyes. Another common symptom is a feeling of roughness or dryness of the lids much like fine grains of sand or dirt in the eye.

*Rhinitis, Pharyngitis, Laryngitis, and Bronchitis*—Cases of irritation of the respiratory tract are somewhat less common than those of conjunctivitis. The symptoms range from a dryness in the nose and

throat, with a dry cough, to pain and the feeling of a foreign body in the throat. With more severe exposure this is accompanied by a sensation of tightness and rawness in the chest and later by mucopurulent expectoration, similar to a diffuse bronchial catarrh. With more severe exposure pulmonary edema may occur with scattered areas of hemorrhagic or purulent consolidation.

#### SYMPTOMS, ACUTE POISONING

With concentrations which but slightly exceed the threshold for acute poisoning, increased respiration over a short period followed by apnea vera may occur. The usual symptom of acute poisoning is unconsciousness within a few seconds, coming on without pain or significant warning. A choking sensation is sometimes experienced, but the period between this symptom and unconsciousness is so short that it rarely permits the victim to escape. As a rule, unconsciousness is followed immediately by cessation of respiration and frequently a short period of tonic convulsions. The heart continues to beat 5 to 10 minutes, during which rescue must be effected and artificial respiration given, otherwise cardiac failure and death will follow. Death is due primarily to asphyxiation.

#### ODOR INTENSITY AND SENSE PERCEPTION

In low concentrations hydrogen sulphide has a characteristic disagreeable odor which is nauseating to some people. Accordingly, it has been termed "stink damp." The intensity of odor cannot be used for judging the amount of gas present, because exposure for a minute or two to very low concentrations, or a shorter to higher, causes an apparent fatigue of the sense of smell, with disappearance of both the degree and character of the odor. This effect is more and more pronounced with increasing concentrations, until it is no longer perceptible. Instead, an acid-like effect or a slight sensation of choking and suffocating is noticeable. A metallic taste is often noted, especially if the person has metal fillings in his teeth.

Measurements of the odor intensity have been made under strictly controlled conditions. Observers who had previously been in hydrogen sulphide free air recorded the impression of the first sniff, thereby reducing fatigue to a minimum. The odor intensities obtained for various concentrations are as shown in Table I.<sup>18</sup>

These data show that in the absence of the factor of fatigue, the odor should be strong, cogent, and forceful in a concentration of 0.0027 per cent, or half the previously designated concentration for 60 minutes' exposure without serious subacute poisoning. In most cases, however, the worker's sense of smell becomes fatigued so rapidly that the actual sense impression is an odor of faint intensity or less, so

TABLE I  
ODOR INTENSITIES FOR VARIOUS CONCENTRATIONS OF H<sub>2</sub>S

Intensity of odor	Concentration of H <sub>2</sub> S in air	
	Parts per million	Per cent by volume
No odor .....	0.022	0.0000022
Detectable; minimum perceptible odor .....	0.13	0.000013
Faint; a weak odor, readily perceptible .....	0.77	0.000077
Easily noticeable; moderate intensity .....	4.6	0.00046
Strong; cogent, forceful, not intolerable .....	27.0	0.0027

he often continues his exposure without apparent discomfort until sub-acute poisoning has ensued.

These measurements also explain the reason for lack of definite trouble from the quantities of hydrogen sulphide in chemical laboratories. The odor is detectable to a person entering the laboratory from fresh air in about 1/400 the maximum concentration for prolonged exposure without serious effects.

#### TREATMENT FOR POISONING

*Sub-Acute Poisoning*—The treatment of sub-acute hydrogen sulphide poisoning varies with the part affected, the degree of poisoning, and the existence of secondary complications. This necessarily makes the treatment symptomatic and leaves the physician to his choice of procedure for the particular condition. In view of the complications which may arise the treatment of sub-acute poisoning, even the mildest form, should always be carefully performed by a competent physician.

*Acute Poisoning*—In acute poisoning unconsciousness and cessation of respiration usually occur in a few seconds to a minute after exposure, followed in 5 to 10 minutes by cardiac failure and death, primarily due to asphyxia. In order to save life, rescue must be effected and artificial respiration applied within a few minutes after the accident occurs. Also, the rescue and treatment must be effected by fellow workmen because time does not permit summoning aid or transporting the victim to a hospital.

The major steps in the treatment of acute poisoning are: (1) get the patient into fresh air; and (2) give artificial respiration immediately if breathing has ceased, become markedly labored or impaired. The Schaefer method is simple and efficient."

Experience has repeatedly shown that if rescue is effected and artificial respiration applied within a few minutes after the victim is overcome, life can be saved almost invariably. On the other hand, experience has also shown that a delay of 10 or 15 minutes jeopardizes the chances of recovery, though this should not be taken as an excuse for laxity in carrying out the prescribed treatment.



The importance of self-protection of those effecting rescue should be emphasized. Cases are on record where the first, second, and even the third person going to the rescue of a fellow workman have all suffered the same fate. The rescuer should always calmly, but expeditiously, plan the procedure, using all available means for self-protection. He should remember that he can hold his breath and remain conscious and unharmed much longer than the time required for the gas to render him unconscious if he breathes an atmosphere that contains enough hydrogen sulphide to cause acute poisoning. He should never enter a confined place, such as a tank, a derrick cellar, or a sewer, unless he uses at least a life line held by two attendants in fresh air, who are capable of giving artificial respiration, because it is very likely that he will be rendered unconscious. If suitable respiratory protective equipment is available it should be used in conjunction with the life line.

#### PREVENTION AND RESPIRATORY PROTECTION

Protection from hydrogen sulphide poisoning may be effected by (1) instruction; (2) mechanical devices for confinement or removal of the gas from places frequented by workmen; and (3) respiratory protective devices.

*Instruction*—Persons working in industries or at places where there is a potential exposure to hydrogen sulphide should be instructed regarding the properties and dangers of the gas; ways of avoiding exposure; all should be trained in giving artificial respiration,<sup>17</sup> the treatment for acute poisoning. It is believed that most cases could be averted by care on the part of workmen to avoid exposure. The value of training in artificial respiration is borne out by the many lives that have been saved by that means.

*Mechanical Devices*—The hazards can be mitigated to a large extent by mechanical devices which will exclude or convey the gas from places frequented by workmen, such as the use of ejectors which take the gas from the casing at a place below the derrick floor; gas-tight look-boxes in refinery receiving houses; and the use of closed systems whenever possible.<sup>5, 8, 9</sup>

*Eye and Respiratory Protection*—Devices which will give satisfactory eye and respiratory protection are available.<sup>5, 18</sup> The respiratory protective devices may be divided into three general classes:

*Canister gas masks*—A canister-type gas mask consists of a face-piece attached to a canister filled with a gas absorbent. Granular soda-lime is generally used for acid gases as a class, of which hydrogen sulphide is a member. For the petroleum and other industries in which organic vapors, as hydrocarbons, occur and against which protection is also desired, the canister is filled with a mixture of granular soda-lime and granular charcoal. The latter is used to absorb organic vapors as a

class, but is also effective for hydrogen sulphide, thereby giving additional capacity to the canister. Devices which will give protection against 2 per cent hydrogen sulphide are available.

Canister gas masks merely remove the deleterious gases. They do not enrich the air or supply oxygen. Accordingly, they cannot be used in atmospheres which do not contain enough oxygen to support life. Their use is thus limited to places where an oxygen content above 17 per cent is assured.\*

*Hose masks*—A hose mask is essentially a gas mask face piece connected to a length of hose through which fresh air is supplied, either by the breathing or by a hand operated blower at the fresh air intake. Hose masks are especially useful for entering tanks or similar confined spaces where the distance from fresh air does not exceed 100 to 150 feet. As the wearer is supplied with fresh air, hose masks will protect against any irrespirable atmosphere that the wearer's skin will bear.

*Self-contained breathing apparatus*—The self-contained oxygen breathing apparatus<sup>19</sup> is a device which supplies oxygen from a small cylinder of the compressed gas. The period of use without recharging ranges from ½ hour to 2 hours of hard work, according to type of apparatus. The atmosphere breathed is entirely independent of external conditions. With some types there is, however, a possibility of permeation of the rubber breathing bag by gasoline vapor when used for extended periods. The self-contained breathing apparatus allows greater freedom of movement and range of operation than the hose mask. It is recommended, however, that a life line be used in all cases where men enter tanks containing a high concentration of hydrogen sulphide or petroleum vapor. As self contained oxygen breathing apparatus are equipped with mouthpieces and not face pieces, gas-tight goggles must be used in conjunction with the apparatus.

*Goggles*—Discomfort and incapacitation from eye irritation is by far the most prevalent trouble from hydrogen sulphide. The eyes appear to be more susceptible to irritation and to cause greater discomfort and pain than the respiratory passages. In many operations such as drilling in gas, pulling tools, casing or closing-in wells, where there is repeated exposure of a few seconds to flows of gas, the workmen hold their breath but keep their eyes open. Gas-tight goggles will give protection in these cases.

#### SUMMARY

1. Hydrogen sulphide occurs more widely, is more toxic, and constitutes a greater industrial health hazard than is generally realized. The principal health hazardous occurrences of the gas are in connection with gypsum mines, sulphur mines, tunnels and caissons in certain localities, sewers and other confined spaces where decomposition of organic matter takes place, blasting of heavy sulphide ores, use of black blasting powder in coal mines, natural gas from certain fields, production and refining of high-sulphur petroleum, its use as a reagent in manufacture of dyes, pigments, and chemicals, and in the rayon industry. The toxicity is comparable to hydrogen cyanide.

2. Two distinct types of poisoning exist—subacute and acute. The former is due to a direct irritating action of the gas on the tissues producing conjunctivitis and moderate to severe respiratory irritation. Acute poisoning is the result of a toxic action on the nervous system produced by the absorption and presence of hydrogen sulphide in the blood. Unconsciousness and respiratory failure usually occur within a few seconds after exposure and the important reaction is paralysis of respiration followed in 5 to 10 minutes by cardiac failure. There are no warn-

\* As low as 12 per cent oxygen will sustain life, but to include a factor of safety, 17 per cent is advised.

ing symptoms and no pain. Death from acute poisoning is due primarily to asphyxia.

3. There is no indication that abnormal combinations with the hemoglobin are formed or that the poisoning is cumulative. Also, there is no indication of a chronic type of poisoning other than would be expected from repeated irritation of the eyes and respiratory passages. The gas is rapidly oxidized in the blood to form non-toxic compounds, ultimately sulphates.

4. Treatment of the subacute type of poisoning is principally symptomatic. With acute poisoning, rescue must be effected and respiration induced at once by artificial means.

5. Although the characteristic odor of hydrogen sulphide can be detected in dilution of 1 part in 10 million parts of air (a concentration far below that causing deleterious effects after prolonged exposure), fatigue of the sense of smell occurs rapidly, thereby excluding the use of the odor intensity as a warning.

6. Hydrogen sulphide in 100 per cent concentrations has been found to have a surface action on the skin (discoloration, red mottling, and erythema). An exposure of the naked arm for an hour, however, did not cause symptoms of action on the nervous system. The entire body of persons has been exposed 30 minutes to 2 per cent hydrogen sulphide in air by volume without noticeable effects of any kind. It is concluded that no serious trouble will be experienced by absorption through the skin when respiratory protective devices are worn.

7. Suitable types of respiratory protective devices in the forms of canister gas masks, hose masks, and self-contained oxygen breathing apparatus are available. Each type of device has its field of use and its limitations.

8. The training of workmen to avoid exposure; the design of equipment to eliminate places of exposure; the use of respiratory protective devices for performing operations in contaminated atmospheres and for emergency work; and the training of workmen in methods of emergency treatment will markedly lessen industrial hazards from hydrogen sulphide.

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# Are the Indians Dying Out?\*

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THIS important question of vital concern to our strictly native population was first raised in an essay entitled "Preliminary Observations Relating to Indian Civilization and Education," published by the Bureau of Education as a contribution to the Philadelphia Exposition of 1876. The author of the report was S. N. Clark, who gave an interesting account of Indian population statistics, estimating for the year 1876 a total Indian population of 291,882. The estimate of the Indian Office in the census of 1870 was 313,371.

While the report in question contains much valuable information, it fails to deal with the fundamental question of defining an Indian for census purposes. Obviously to ignore the large amount of race intermixture which has taken place since the settlement of the country, and which constantly tends to merge persons of Indian blood or part Indian descent into the white race, fails to take cognizance of a situation which at all times has complicated efforts to determine the question whether the true Indian is dying out. The true Indian in this sense is the full blood without white intermixture, or at least an Indian of one-fourth degree of intermixture, in which Indian physical traits are still fairly cognizable. It would be utterly hopeless to estimate the number of persons enumerated as whites who have Indian blood in their veins, but it must have reached prodigious proportions during the long course of years. It may even be questioned whether it is fair to enumerate as Indians persons who have one-fourth Indian blood and three-fourths white blood. Probably a better compromise would be to enumerate as Indians only persons who are of not less than one-half Indian origin.

Since 1910, the U. S. Bureau of the Census has made no serious attempt to enumerate the Indian population according to degree of racial intermixture. In that year the Indian population of continental United States, exclusive of Alaska, was 265,683. Of this number, 56.5 per cent were full bloods, 35.2 per cent were mixed bloods, while for 8.4 per cent the degree of intermixture was not stated. The mixed

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blood Indian population numbered 93,423, of which 8,000 were white and Indian intermixture; 2,555 negro and Indian; 1,793, white, negro and Indian; 80 other intermixtures, while for 1,265 the origin of intermixture was unknown. The percentages of intermixture vary, of course, widely for different tribes. Some are practically pure blood, like the Navajos of Arizona and New Mexico, while others have practically lost all Indian characteristics. For all practical purposes the question as to whether the Indians are dying out is therefore one which concerns chiefly the pure bloods, or the type which is still maintaining typical Indian characteristics. It is to be hoped that the forthcoming census will concentrate attention upon two points, namely, whether the Indian enumerated is of pure blood or mixed blood origin. Without anticipating the results of the 1930 census, I feel reasonably safe in stating that the probable number of pure bloods will not vary materially from that in 1910. Unfortunately no such differentiation was made in the census of 1920.

The present discussion is not concerned with tribal mixtures although that question is one of no small degree of practical importance. Of the 150,053 full blood Indians enumerated in 1910, 139,389, or 92.8 per cent, were full tribal bloods, while 10,251 or 6.8 per cent were of mixed tribal origin, and for 513 persons the tribal blood of one parent was unknown.

Aside from the complications arising from a complete and accurate enumeration of Indians on the ground of racial purity, there are still more serious difficulties in tracing the entire Indian population of the country in view of the half-hearted attempts which have been made in this direction by the census in former years. It is characteristic of all the estimates of Indian population that they rest, to a large extent, upon mere conjecture, and hence all speculations as to whether the Indians are dying out are too largely conjectural to be entitled to entire confidence.

The first serious attempt to enumerate the Indian population was made by the Rev. Jedidiah Morse, whose Report to the Secretary of War was published in 1822. In this enumeration there were numerous omissions, due to the unsettled condition of the country, which seriously invalidated the totals. The figure given was 471,034. Estimating inevitable omissions, partly affected by boundary limitations, it is probably safe to assume that the Indian population in 1820—at that time largely full bloods—was 500,000.

In 1850 a second serious attempt was made by H. R. Schoolcraft, one of the outstanding authorities on Indian Affairs. He arrived at an estimate of 388,209. The census of 1850 placed the Indian popula-

tion at 470,764. Mr. Schoolcraft's figures would indicate that during the 30-year interval the Indian population had decreased over 100,000. He made a second report in 1857 in which he estimated the Indian population to be 379,264. In 1870, the U. S. Bureau of the Census made a further effort to enumerate the Indians and the number arrived at was 313,712. Thus during the 20 years intervening from 1850 to 1870, there was a further decline as ascertained by the methods of enumeration then in vogue.

It would carry me entirely too far to discuss the fallacies inherent in practically every estimate thus far presented. The most impressive recent discussion on the question is an essay on "The Aboriginal Population of America North of Mexico," by James Mooney, another outstanding authority on Indian affairs, published in the Smithsonian Miscellaneous Collections of February 6, 1928. This report includes a wealth of data not heretofore available, particularly with reference to extinct tribes, of which he enumerates quite an impressive array, suggestive of the conclusion that small tribes are much more likely to become extinct than larger ones which are more resistant to the encroachments of the white population. Mr. Mooney estimates the Indian population of the continental United States at 266,000, but adding thereto the Indians of British North America, Alaska and Greenland, he arrives at a total of 406,000 for North America. While Mr. Mooney gives the Indian population of Canada as 101,000, the Canadian census of 1921 gives it as 110,596. This raises another question of accuracy, namely, how far the Indian tribes migrate from the United States to Canada, particularly along the border of New York State and British Columbia. Without enlarging upon Mr. Mooney's interesting and instructive investigation, I take it that the general conclusion would be to the effect that the Indians are declining in population and that the ultimate extinction of many of the smaller tribes at least is a foregone conclusion.

Mr. Mooney estimated the original Indian population of New England as about 25,000, practically all of whom have disappeared. In New York State the Indian population is between 5,000 and 6,000, but this number includes so large a number of mixed bloods that probably few full bloods remain, while the population itself has reached a stationary condition. Of the once prominent Montauk tribe on Long Island, said to have numbered 6,016, only 30 remained in 1907. These melancholy results have been observed in practically all parts of the country with the possible exception of the Southwest.

The Navajo population problem I have discussed elsewhere, pointing out that that tribe, as much as any in the country, is very well

holding its own and now probably numbering as many as at any time during its historic period. A complete enumeration of the Navajos made by the Bureau of Indian Affairs under the direction of Rachel M. Jenss during the summer of 1928 showed over 40,000, practically all full bloods, compared or contrasted with about 10,000 enumerated by various methods in 1857. It is to be hoped that the Indian Office will continue this method of enumeration, which includes finger printing and numerical disc distribution, for at least the principal outstanding tribes, particularly the Chippewas, the Sioux, and the Indians of California and Oklahoma. In Texas, where the Indians, even 30 years ago, were quite numerous, the number remaining in 1910 was only 702. Recent investigations, however, suggest that the number is somewhat larger, in that some Indians are located in remote sections of the state, eking out a precarious existence, calling for Congressional aid in the purchase of lands.

The only other notable attempt to estimate the past Indian population of the country was made by Prof. H. J. Spinden, Peabody Museum, Harvard University, published in the *American Geographical Review* of October, 1928. Prof. Spinden arrived at the conclusion that there are fewer Indians today than at the coming of the Europeans, which is, of course, accepted by all who are familiar with the facts. He estimated that about 1200 A.D. the number of the red race in the entire Western Hemisphere was between two and three times that at present, or say between 50,000,000 and 75,000,000; also that the present equivalent of Indian blood in the Western World is in excess of 25,000,000 individuals; but he does not give separate estimates for the United States. He accepts, however, the Indian Office returns for 1921 which give an estimated Indian population of 349,964.

Prof. Spinden is of the opinion that the main factor accounting for the diminution in population has been disease in epidemic form. It is that conclusion which suggests the importance of the Indian population problem to the American Public Health Association—in former years practically completely ignored as an outstanding problem in our American public health administration. In season and out for a number of years the late Dr. Joseph K. Dixon called attention to the Indian population problem, picturesquely referred to as "The Vanishing Race." If Dr. Dixon's ideas could have been carried out through the aid of some great foundation much might have been done to place the facts of our Indian population upon a sound statistical basis. Frequent statements as to the lamentable health conditions of Indian reservations or settlements otherwise are no longer in strict accordance with the facts. It is my own conclusion based on many years of ob-

servation that health conditions during the last three decades have been very materially improved, and were never better than at the present; however much remains to be done to make them conform to the sanitary ideals of the white population.

Every question of race survival involves the accurate ascertainment of the birth rate and the death rate and the excess of the former over the latter. What this excess is in the Indian population is not at the present time accurately ascertainable. Fortunately the Bureau of Indian Affairs during 1928 established a Division of Vital and Medical Statistics which is making strenuous efforts to improve both birth and death registration. The statistics collected heretofore by the U. S. Bureau of the Census for the Indian population left much to be desired. As regards births particularly, there are great difficulties to be overcome, the solution of which will require years of persistent effort and adequate field and follow-up organization.

The efforts of the U. S. Bureau of the Census in extending the registration area of the country at large are precisely those which would be most useful in extending birth and death registration among our Indians, but at the outset it is most important that the mere facts of births and deaths should be ascertained before efforts are made to improve the information contained on the birth and death certificates with reference to causes or connecting circumstances. With the improvement of the Indian medical organization, rapid progress in this direction may be anticipated. Indians are learning to make more general use of the hospitals provided for their needs, even for maternity cases, which, of course, is most desirable, and in course of time will lead to better data on births and deaths.

#### SUMMARY

1. The question as to whether the Indians are dying out cannot be answered in a satisfactory manner at present. It is sincerely to be hoped, however, that the census of 1930 will give particular attention to the accurate and complete enumeration of the Indian population according to degree of blood intermixture so that the full blood Indian population may be ascertained, at least with approximate accuracy. It is gratifying in this connection to be able to say that there is full co-operation between the U. S. Bureau of the Census and the Bureau of Indian Affairs, giving encouraging assurances in this direction.

2. All speculations regarding the survival of Indian tribes should rest solely upon the full blood population, for the remainder of mixed bloods represents a heterogenous mass of people imperceptibly shading off to the white population, who cannot be accurately enumerated by any method known to science. It has been suggested that blood tests would be successful but such would obviously be inapplicable to a census enumeration.

3. The question of race survival is obviously, in the case of the Indians, pri-



marily a question of an excessive death rate. The Bureau of Indian Affairs therefore should be encouraged in every way possible to continue in its present efforts, while nothing should be left undone to secure for it an adequate Congressional appropriation.

4. The outstanding mortality problem of the Indians is tuberculosis and non-tuberculous respiratory diseases. The reduction of these depends essentially, on the one hand on better earning power and better nutrition, and on the other on better medical and hospital service. What has been done in this direction is suggestive of a large measure of progress indicative of further advances in the near future.

5. The outstanding need of the Indian health situation is for more trained and otherwise competent hospital and field nurses. These can aid materially in pre-natal and postnatal work, directed toward the reduction of the excessive mortality in infancy. Coöperation has been given the Bureau of Indian Affairs in this direction by voluntary health promoting agencies.

6. Finally it may be said that the Indian is a most deserving type of our civilization, and entitled to every possible consideration that will aid in his survival. The race has always produced men of outstanding ability, showing will power, courage and intelligence, and its leaders may be trusted to aid every deserving effort demanding the fullest coöperation on the part of the Indian people. But unless present-day efforts for the amelioration of living conditions and the lowering of the death rate are maintained at the highest possible level, the dramatic picture of a vanishing race will unquestionably come to a reality, much to our sorrow and much to our shame.

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## Size of the Family and Mental Ability of Children—Germany

IN an effort to ascertain the relation between the size of the family and the quality of the child's school work, as a partial reply to the question as to the rate of propagation of the less intelligent of the population, a study was made at the suggestion of the well known biologist Prof. Lenz, of Munich, of 870 public school children.

The group consisted of (1) normal children, (2) retarded children unable to follow the regular course, but able to complete a part of the required course, and (3) mental defectives.

It was found that families of the children below normal mentality were  $1\frac{2}{3}$  times as large as those of normal children, also that the latter families did not reproduce themselves sufficiently to maintain the stock, while those below normal showed a definite increase. These results are similar to those obtained previously by another writer in another city.

The normal children in this study were divided into five groups according to their school marks. Those in the two highest groups came from families with a birth rate below the average for that city; in the two lowest groups the birth rate was above the average; moreover, the families of the children with the lowest marks had a birth rate twice as high as those with the highest marks. The above data also agree on the whole with those obtained by two other writers for schools of another city.—*Archiv. für Rassen- und Gesellschaftsbiologie*, Munich, 22, 2: 191, 1929.

# Thermal Death Points of Pathogenic Bacteria in Cream and Ice Cream\*

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CONSIDERABLE study has been made of the thermal death points of bacteria in milk. Little has been done to determine whether the pasteurization temperature and time (143.5° F. for 30 minutes)<sup>1</sup> recommended is sufficient to kill the non-spore bearing pathogenic bacteria which may contaminate cream or ice cream. The question arose as to whether the higher percentage of butter fat in cream or ice cream would act to protect the bacteria in ordinary pasteurization.

The methods used by Park<sup>2</sup> formed the basis for the test procedures. The organisms used were:

1. Two strains of *B. typhosus* recently isolated from cases
2. Two strains of beta type hemolytic streptococci, one from scarlet fever, the other from septic sore throat
3. A culture of tubercle bacillus of the bovine type

The typhoid bacilli and the streptococci were grown in veal broth for 18 hours, then diluted with sterile broth to an appropriate density. The tubercle bacilli were cultivated on glycerine beef broth. The pellicle, after 3 weeks' growth, was filtered off, weighed and emulsified in sterile physiological saline, and diluted to a final concentration of 0.2 mg. of dry tubercle bacilli per c.c. of suspension.

Cream with 50 per cent butter fat content was sterilized in the autoclave for 30 minutes at 15 lb. pressure. For the test, 9.9 c.c. were measured into each of a series of small bottles. After heating until the cream was at the test temperature, 0.1 c.c. of the culture was added to each bottle. These were then stoppered tightly, vigorously shaken, and submerged in the water bath at the test temperature. Five temperatures from 135° to 145° F. were used. Samples were taken at various intervals. After heating for the desired time, the bottles were removed from the bath, shaken, and covered with cracked ice. After chilling, the cream was tested as follows:

\* Read at a Joint Session of the Public Health Engineering and Food, Drugs and Nutrition Sections of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 4, 1929.

1. For the isolation of *B. typhosus*, six brilliant green agar plates were used. Two were inoculated with 0.2 c.c. each and one with 0.1 c.c. of the cream, this inoculum being streaked over the other three plates. At the same time, two tubes of bile peptone solution were inoculated with 2 c.c. of the cream. These were incubated for 18 hours for enrichment, and the bile was then plated on brilliant green agar. All plates were examined after 18 hours' incubation and slide agglutinations done with all suspicious colonies. As a further check on positive findings, the suspicious colonies were fished to Krumwiede's triple sugar medium.

2. For isolation of the streptococci, 1 c.c. and 0.1 c.c. amounts were pipetted into tubes of melted blood agar, which, after mixing, were poured into Petri dishes. One c.c. of each sample was also inoculated into tubes of blood broth for enrichment, and after 24 hours' incubation, plated with blood agar. All hemolytic colonies appearing on these two series of plates were fished into blood broth and incubated. As a final check, blood plates were poured from all fishings to determine that the streptococci recovered were of the beta hemolytic type.

3. Guinea pigs were used to test the survival of tubercle bacilli, three pigs for each sample. Each pig was inoculated subcutaneously into the knee-fold region with 1 c.c. of the cream. Pigs dying within 8 days were discarded; those dying at a later date were autopsied; those surviving 42 days were killed and autopsied. Smears were made of all suspicious lesions and examined for acid-fast bacilli. When no acid-fast bacilli were found, subinoculations were made into other guinea pigs.

The results obtained in the above series of tests are given in Table I. The streptococci did not survive heating in cream at 135° F. for 5 minutes, nor at 140° to 142° F. for 1 minute. At 143.5° and 145°

TABLE I  
THERMAL RESISTANCE OF BACTERIA IN CREAM

Organism	Temperature Fahrenheit	Survival of Organisms after:								
		½ min.	1 min.	2 min.	3 min.	4 min.	5 min.	7 min.	10 min.	20 min.
<i>B. typhosus</i>	135.0	+	+	+	+	+	+	+	—	—
	140.0	+	+	+	+	+	—	—	—	—
	142.0				*—	—	—	—	—	—
	143.5	+	+	—	—	—	—	—	—	—
	145.0	+	+	—	—	—	—	—	—	—
Streptococci	135.0	+	+	+	+	+	—	—	—	—
	140.0	+	—	—	—	—	—	—	—	—
	142.0	+	—	—	—	—	—	—	—	—
	143.5	+	†	—	—	—	—	—	—	—
	145.0	+	†	—	—	—	—	—	—	—
<i>B. tuberculosis</i>	135.0									*—
	140.0	+	†	+	+	+	+	+	—	—
	142.0	+	†	+	+	+	+	—	—	—
	143.5	+	†	+	+	+	+	—	—	—
	145.0				*—	—	—	—	—	—

\* Shortest time tried.

† No 1 minute specimen tried.

Unheated controls—original numbers of organisms per c.c.: *B. typhosus*, 87,000; Streptococci, 90,000; *B. tuberculosis*, 6 pigs inoculated developed generalized tuberculosis.

Average life of control pigs was 33 days. None survived full test time of 42 days.

+ indicates the organisms survived.

— indicates the organisms did not survive.

F., no test was made after 1 minute, but after 2 minutes there was no survival of streptococci. Typhoid bacilli heated at 135° F. were killed in less than 10 minutes, at 140° in less than 5 minutes and at 142° to 145° F. in less than 3 minutes. Tubercle bacilli in cream were killed\* in less than 20 minutes when heated at 135°, in less than 10 minutes at 140°, in less than 7 minutes at 142° to 143.5°, and in less than 3 minutes at 145° F. In every case, controls of unheated infected cream contained a much larger number of pathogenic bacteria than cream would contain under natural conditions of contamination.

Similar experiments were done using an ice cream mixture supplied by one of the local ice cream manufacturers. This consisted of cream, milk, condensed milk and sugar in the proportions used commercially. The resistance of *B. typhosus*, streptococci, tubercle bacilli and a strain of *B. diphtheriae* was tested.

The technic for the determination of the survival of the *B. typhosus*, streptococci, and tubercle bacilli, was the same as in the preceding experiment. For the isolation of *B. diphtheriae* 1 c.c. and 0.1 c.c. amounts of the samples were pipetted into tubes of melted serum agar.

TABLE II  
THERMAL RESISTANCE OF BACTERIA IN ICE CREAM MIXTURE

Organism	Temperature	Survival of Organisms after:				
	Fahrenheit	½ min.	1 min.	3 min.	5 min.	6 min.
<i>B. typhosus</i>	145	+	+	+	—	—
	150	+	+	+	—	—
Streptococci	145	+	+	+	—	—
	150	+	+	+	—	—
<i>B. diphtheriae</i>	145	—	—	—	—	—
	150	—	—	—	—	—
<i>B. tuberculosis</i>	145†	+	+	+	+	—
	150†	+	+	—	—	—

Numbers of organisms in unheated controls:

<i>B. typhosus</i> .....	87,000 per c.c.
Streptococci .....	46,000 per c.c.
<i>B. diphtheriae</i> .....	2,000 per c.c.
<i>B. tuberculosis</i> .....	6 pigs inoculated all developed generalized tuberculosis *

\* One of the control pigs survived 42 days. Average life of others was 34 days.

† All pigs showing generalized tuberculosis survived 42 days.

+ indicates organisms survived.

— indicates organisms did not survive.

After mixing, the agar was poured into Petri dishes. One c.c. of each sample was also measured into each tube of serum broth for enrichment. After 18 hours' incubation both plates and tubes were examined for the presence of *B. diphtheriae*.

The results of these tests are shown in Table II.

*B. diphtheriae* in an ice cream mix did not survive heating for ½

\* Failure to produce infection in guinea pigs is considered as meaning bacilli were killed. These figures are somewhat lower than frequently given.

minute at 145° to 150° F. *B. typhosus* and the streptococci were killed in less than 5 minutes at these temperatures. Tubercle bacilli were killed within 6 minutes at 145° F., and within 3 minutes at 150° F. In comparing these results with those of the cream experiments, a slightly greater resistance was noted in the mix. This, however, was so slight that it falls within the limit of technical variation.

#### CONCLUSION

The time and temperature (30 minutes at 143.5° F.) recommended by the Committee on Dairy Products and Eggs, American Public Health Association, for the pasteurization of milk allows an ample margin of safety for the pasteurization of cream and of commercial ice cream mix.

NOTE: Part of the expense of this investigation was borne by the Research Laboratories of the National Dairy Products Corporation, Inc.

ACKNOWLEDGMENT: The authors desire to express their appreciation of the kind assistance of Dr. Park and members of his staff in these experiments.

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2. Park, William H. Thermal Death Points of Pathogenic Bacteria in Milk, *A. J. P. H.*, 17, 1: 36 (Jan.), 1927.

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## National Children's Bureau of Argentina

A BILL for the establishment of a National Children's Bureau (Dirección nacional de la niñez) was recently introduced into the Congress of Argentina.

The main functions of the bureau will be to study the problems of improving the race of the future, to organize local councils in the capitals of the provinces and territories, and to establish institutions necessary for the carrying out of the work. The local councils are to open dispensaries for the treatment of physical and mental disorders of children. The bureau is to cooperate with the juvenile courts on the principle that a delinquent child is a sick child and must be treated as such, and is to establish reformatories with facilities for the medical treatment of the inmates.

The bill also provides for the establishment of a medical register of all school children in the country; this register to consist of individual records, each prepared after a thorough physical examination and mental test.—*Boletín del Museo Social Argentino*, Buenos Aires, Feb., 1930, p. 96.

# Financing Home Sanitary Facilities on the Easy Payment Plan\*

THIRTY states sent replies to the questionnaire submitted by the committee. Of this number only one, Maryland, limits the making of mechanic's liens to labor, and that only in Baltimore. From this it is assumed that the manufacturers of toilets, plumbing fixtures, and pipes have the same course open to them for installing these conveniences on a time payment basis as the roofing or paving contractors.

In answer to the second question as to whether any city or county had financed sanitary installations in the homes and then collected from the property owner at intervals, Maryland, Mississippi, North Carolina, South Carolina, Tennessee, and Wisconsin answered in the affirmative. With respect to Alabama, Mr. Hazlehurst says:

While a municipality has a right to bond for public improvements or to collect as taxes, if they so desire, the cost of such improvements, we have not found a town yet which has been willing to handle the work in this way. Legally and theoretically there is no reason why the work cannot be done in this way as sewers are installed. There seems to be, however, a mental attitude on the part of municipal councils which prohibits them from entering this field.

In Kansas, according to Mr. Boyce, the last legislature authorized service charges in cities of the third class, while health officers may order sanitary improvements to eliminate nuisances and charge the cost as a tax against the property. The statutes of Louisiana allow cities to force sewer connections, charge the cost against the property, and collect in five annual installments; but there is no record of any city having taken advantage of this provision. This is likewise true in Maine, Maryland, and Wisconsin. H. A. Kroeze of the Mississippi State Board of Health advises:

Several cities in the state have financed outright the installation of pit toilets and sewer connections and then collected on the installment plan over a period of 10 years. We have been able to interest several cities in this plan which has enabled us to do a vast amount of sanitation very easily, and over a short period.

Cities of North Carolina have availed themselves of the privilege of forcing sewer connections, and have collected, but usually have safeguarded the investment by tax liens.

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\* Report of the Committee on Rural Sanitation presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 1, 1929.

A. E. Legare of the South Carolina Board of Health says:

Two towns have installed pit privies under contract for private parties, collecting monthly for 2 years to pay for such installations.

We are advised that in Tennessee:

Shelby County in the territory adjoining Memphis, 2 years ago put in thousands of concrete slab and concrete riser pit privies—some on a cash basis but a large part on credit.

Our next inquiry was whether any corporation or banking concerns were financing such installations, and on what basis. In Delaware we find the Delaware Mortgage Corporation at Wilmington finances such improvements and has a monthly charge for paying off the interest and principal. The Standard Sanitary Manufacturing Company has a division in its organization for handling such financing. In Maryland, Ohio, and Rhode Island, such improvements are handled through building and loan associations, while the Commercial Credit Company of Baltimore advises that it will make such loans in the ordinary course of business if applied for and the proper security given. In Mississippi the state laws allow cities to create a sanitary fund for the purpose of loaning money to property owners for the installation of sewer connections and plumbing fixtures. The cost of the installation is paid for by the city; property owners sign 10 notes bearing 6 per cent interest; and the money is repaid in 10 annual installments. When the city has a sufficient quantity of such notes, it reissues its own notes and sells these to financing corporations.

In North Dakota banks will loan money for such installations in the same manner as for other improvements, taking a mortgage on the property. With regard to this point, the State Sanitary Engineer of Rhode Island advises:

A number of plumbing firms and supply houses install sanitary facilities on the partial payment plan. . . . Two coöperative banks take first mortgages on property to cover any reasonable investment of this kind, payments to be spread over a term of years. We have also a considerable number of acceptance and finance corporations from whom small loans can be obtained to be paid back in weekly or monthly installments, usually at a rate of interest which is rather high. I am informed that some of the small contractors who take jobs on the installment plan simply endorse the notes for the work they have done and discount them with one of the acceptance corporations.

In Tennessee there are several financial institutions that handle paper on building improvements, particularly the General Securities Company of Nashville. Other institutions simply buy the lien notes after they have been made out. In West Virginia one insurance

agency constructs septic tanks and private sewer systems on a monthly payment basis.

In Texas some 15 communities ranging between 500 and 10,000 population have been able through the coördinated efforts of the local officials, the State Health Department, and finance corporations, to install numerous individual private plumbing systems and thousands of pit toilets, thereby bringing sanitary facilities to homes which otherwise would not have had this service—at least not for many years, or perhaps not at all. The State Health Department promoted the work and gave it moral support; the communities passed the necessary ordinances and acted as collecting agencies; while the corporations furnished the materials and made the installations upon the guarantee of the city for their pay.

In some of these towns, individuals were paying a scavenger fee of \$1.50 a month, but under the new system the surface and can toilets were replaced by pit toilets and a rental charge of \$1.00 a month substituted. Under the scheme employed by the Sanitary Appliance Company of Houston, the materials for the pit toilets were furnished and money advanced to pay for the labor of installing. The toilets were then leased to the householder, while the city became the collecting agency. The money accruing from these rentals or leases is used to pay the Sanitary Appliance Company first, including interest on its investment, and after that debt is discharged, the toilets become the property of the city, which continues to lease to the householder, the rentals accruing to the benefit of the city. By this method scavenger fees have been eliminated and eventually a sanitary fund is built up in the city's treasury, while the householder gets a better service at a lower cost.

The Crane Company advises that a partial payment method is now being tried out at its Utah branch. The Standard Sanitary Manufacturing Company advises that it is now offering a plan for financing plumbing in homes, provided the project is underwritten by a local plumbing firm. The Wolff Company has tried out the partial payment plan but it did not work satisfactorily.

It will be seen that the problem of financing home sanitary facilities on the deferred payment plan has been seriously attacked, although the solution has hardly gone beyond the experimental stage. It seems reasonable that a plan might be worked out which will meet the approval of health authorities, manufacturing and installing plumbers, contractors, and the householder.

On the basis of this study, the following conclusions are drawn:

1. Health authorities have found it profitable to encourage and give moral



support to commercial concerns which manufacture, sell, and install sanitary equipment, in extending their services to home owners on reasonable terms.

2. Where provision has not already been made, it might be profitable to encourage the passage of laws which will permit cities and counties to create a sanitary fund and issue warrants thereon for financing sanitary facilities such as water and sewer connections, heating appliances, screens, and suitable outdoor toilets; and allow the householder to pay in annual installments, say, over a period of 10 years.

3. Where it is not feasible for cities and counties to finance installations as indicated in "2," corporations should be encouraged to do so under a deferred payment plan which seems to be a legitimate and satisfactory outlet.

4. It has been shown that the cost of plumbing can be reduced if cities will adopt ordinances embodying the best features of the plumbing code devised by the Hoover Committee, and if manufacturing plumbers will employ modern mass production and distribution methods.

### RECOMMENDATIONS

1. That this committee be resolved into a joint committee composed of representatives of the American Public Health Association and the Conference of State Sanitary Engineers; and that this joint committee invite representatives of the plumbing and heating industries, the U. S. Departments of Agriculture and of Commerce, and of the Federal Trade Commission, to assist in making further studies of the entire problem of financing home sanitary facilities.

2. That the work of this joint committee during the coming year be focussed upon a study of existing schemes of financing home sanitary facilities and to project plans which will facilitate their installation.

V. M. EHLERS, *Secretary—Acting Chairman*

JANE H. RIDER

W. SCOTT JOHNSON

G. H. FERGUSON

W. M. OLSON

PAUL S. FOX

H. A. YOUNG

H. B. HOMMON

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## National School of Hygiene in Chile

A MINISTERIAL decree of December 11, 1929, provides for the establishment of a National School of Hygiene (Escuela Nacional de Higiene) for the purpose of training specialists in hygiene, bacteriology, and certain related subjects. Normal courses in personal hygiene and school hygiene will be given for teachers in primary, secondary, and normal schools. One of the departments of the school will be devoted to maternal and child hygiene.—*Diario Oficial*, Santiago de Chile, Dec. 28, 1929, p. 7080.

# Epidemiology in State and City Health Organizations\*

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STATE and city health organizations, if properly constituted, will include as part of their basic structure provision for epidemiology. Certainly this is true in so far as this science is concerned with the study and control of the communicable diseases of man. Even the health organization of the town, county, or state, limited in personnel to health officer, nurse, inspector, and clerk, will find epidemiological activities essential. It should collect morbidity data, study cases of communicable diseases by clinical and laboratory methods, consider environmental factors, interpret the observations, and indicate and apply effective protective or control procedures with the utmost promptness and directness.

The organization having greater resources—which usually means that it serves an area having greater population and wealth, and as a rule greater interest—can introduce a considerable degree of specialization. That is, it can employ specialists or technical workers, such as epidemiologists, statisticians, sanitary engineers, and bacteriologists. Since the state health organization is expected to serve a vast area and to supply epidemiological and other specialized aid to the town and county organizations unable to have their own specialists, it should adopt the specialized type of organization, even when the total budget is relatively small. The local organization, on the other hand, is expected to supply immediate and continuous service throughout the community in home, school, and business establishments. These measures necessitate a large proportion of the expenditures for nurses and inspectors. The organization would not, therefore, be able to employ technical workers except when its budget was relatively large. It would usually be expected that a county or city having a health budget of from \$40,000 to \$50,000 yearly would employ technical workers in one or more branches of its service. When the budgets range from \$100,000 to \$1,000,000 or more for state or city organizations, we should expect to see well defined divisions for each of the

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\* Read at a Joint Session of the Health Officers and Epidemiology Sections of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 2, 1929.

essential specialized services. Each division would include at least one technical worker, frequently several, and the necessary clerical assistants.

Epidemiology, in most of the state and large city organizations, would constitute one of these divisions. In a number of the larger organizations there is not a separate division for the epidemiological service, but it is conducted as a subdivision of a major bureau for preventable or communicable diseases. Under this plan, the services for venereal diseases, tuberculosis, or malaria, may also form subdivisions. Certain states having approximately 500,000 inhabitants or less, and limited resources, have not yet been able to secure funds sufficient to finance all the basic branches of their health organizations. They have found it necessary to have one technical worker function as director of two divisions. For example, the laboratory director may have to serve also as epidemiologist, or *vice versa*. Such an arrangement is unfortunate and, of course, should be regarded as temporary.

Regardless of the exact scheme of organization, the importance of epidemiology should not be underestimated. Its director should have a status coequal with that of other division directors; the budget should be adequate; the salary attractive; and tenure assured on a merit basis. Moreover, the coöperation between the personnel of the epidemiology division and that of the other central divisions should be of the closest. If the division is to function effectively, it must assemble and classify all pertinent data regarding preventable diseases, interpret their meaning, and make its conclusions available for administrative guidance with the utmost promptness. The laboratory can supply primary information as to the presence of diseases; the vital statistician, mortality records; the sanitary engineer, information on danger or occurrence of diseases due to polluted water or milk.

Morbidity records are essential to any successful plan of disease control, but their value will be determined largely by their accuracy, completeness, the promptness with which they are received, and the information utilized. The epidemiologist is dependent upon the local health service to collect these records from the doctors and other sources. Moreover, the central or state health service has to depend to a very large degree upon the local organizations to carry out the best control procedures based upon present knowledge. Thus we are very largely dependent upon the local organization to collect epidemiological data and to apply the knowledge obtained to the control of disease. Existing knowledge and any new facts which may be discovered can be applied most satisfactorily when there has been established adequate local health machinery. Incidentally, it is extremely

unfortunate that the vast amount of knowledge now at our disposal is applied in such a limited way. All those who are familiar with the situation understand quite well that this is due to backwardness in the development of effective public health machinery, particularly for local or community service. The state epidemiologist, in the absence of local health organizations or without their hearty coöperation, will be able to accomplish comparatively little. These two branches, which are so basic in any sound scheme of public health organization, curiously enough have been relatively backward in their development.

Having considered the place which epidemiology should occupy, we might examine our health organizations to see how it has fared. Although the control of communicable diseases gave rise to the public interest which led originally to the establishment of health organizations, a number of related subjects during the past twenty years have commanded attention to a degree which has somewhat sidetracked the original purpose. In part this may be due to the greatly lessened importance of certain diseases, such as yellow fever, cholera, and plague, which in former times gave rise to disastrous epidemics. In part it may be due to the successive waves of interest stimulated in sanitary engineering, tuberculosis, hookworm disease, malaria, venereal diseases, maternity, infant welfare, and so on. These stimuli have been most fortunate, but with them there should have been a corresponding growth of interest in communicable disease control, including the epidemiological service which supplies the knowledge upon which the control efforts should be based.

Of the 48 state health organizations, about 20 rely upon the state health officer or a member of his staff without special training to function as epidemiologist. About 25 have budgets for one or more epidemiologists, most of whom are doing, or are capable of doing, creditable work. About 8 have appointees whose activities relate largely to quarantine and law enforcement and who do very little, if any, actual epidemiological work. Perhaps not more than 10 states have had the services of real epidemiologists for as long as 10 years. Ten or 12 others within the past 5 years have employed men who have taken courses in epidemiology in schools of public health.

Although I am less familiar with the status of epidemiology in the city health services than in the state, *Public Health Bulletin No. 164* states that in 1925 the 100 largest cities of the United States expended \$18,974,583 for specific health services and \$2,632,484 or 13.87 per cent was applied to communicable disease control. The states in 1925 (*Public Health Bulletin No. 184*) expended \$10,144,850, not including funds for tuberculosis sanatoriums. The percentage of their ex-

penditures that went into communicable disease control, exclusive of venereal diseases, ranged from 1.5 to 32.6. Although the figures are incomplete, it appears that only about 25 per cent of the states expended as much as 10 per cent of their resources on communicable disease control, exclusive of tuberculosis and venereal diseases, which were reported separately. The records do not indicate what part of the funds allocated specifically for branches of communicable diseases was applied to epidemiology either in states or cities.

The analysis for the state services shows that the salaries generally are too low to attract or hold the best type of men, and the compensation allowed in divisions of communicable diseases and epidemiology offers no exception to the rule. Only 3 states pay their directors as much as \$5,000 per year. Salaries in 10 others range from \$4,000 to \$4,800, and in 15 others from \$3,000 to \$4,000.

These figures lead naturally to a consideration of the kind of personnel that is engaged. In the state services, and the same is true I believe in the city services, a considerable number of very capable men are at work rendering fine service despite the poor compensation. One-third of the states perhaps have at least one man who, by training and experience, is qualified to conduct epidemiological field studies. In approximately half of the states the situation is far from satisfactory. It is not unusual for activities to be undertaken involving the expenditure of considerable sums by inadequately trained personnel. The activities are conducted in the absence of a health survey by qualified persons who could define the health problems, determine their relative importance, and outline the program of work calculated to yield the best return for each dollar spent.

Further evidence of the unsatisfactory situation is reflected in the absence—a few states and cities excepted—of complete and reliable morbidity records. Without accurate information as to the incidence of diseases, health departments can merely grope in the dark. Now that 17 states and 26 cities are each spending yearly from \$200,000 to \$5,000,000 (New York City \$5,000,000, Pennsylvania \$1,500,000), and other states, cities and counties relatively large amounts, need for more efficient guidance in public health measures is urgent.

As indicated, there has been improvement in the situation during the past 10 years; but progress seems to be too slow. A hopeful development was the conference, in Baltimore in 1927, of a group of more than fifty scientists interested in epidemiology. Their purpose was to obtain a consensus of opinion with regard to epidemiological services in public health organizations and to make it available for health agencies, legislative bodies and the public. The proceedings were published in the JOURNAL.<sup>1</sup> More extensive use, in my judg-

ment, should be made of them. As I was a member of a special committee appointed to draft recommendations for the "organization of epidemiological service within state departments of health" and as the conference in approving these recommendations voted that "the principles applying to state departments are also applicable to departments of large cities," I quote the recommendations as adopted:

1. There shall be a bureau or division dealing with epidemiology in each state health department coequal with other essential divisions in the organization.

2. The function of this bureau or division, with respect to investigation of disease, shall be:

(a) The analysis of morbidity statistics whether these be collected directly or through some other division.

(b) The correlation of the mortality statistics obtained through the division of vital statistics with the morbidity data.

(c) The securing of immediate information from the division of sanitary engineering or other divisions as to the prevalence of disease.

(d) The use of laboratory data as a source of primary information as to the existence of communicable diseases.

(e) To secure special service from any division as to the causative factors of disease.

(f) To classify, analyze, and interpret all available information with reference to disease, for administrative guidance in formulating sound plans of procedure, and acquainting health agencies, the medical profession, and the public with the facts.

(g) To conduct field investigations for the purpose of collecting or discovering facts essential to more effective control procedures.

(h) To assist local authorities in epidemiological activities.

3. The work of the division requires the services of professional, clerical, and field personnel.

(a) By "professional" personnel reference is made particularly to the director of the division. He should possess exceptional inherent qualities such as sound judgment, tact, and poise. He should be well grounded in the knowledge of medicine and public health, and have special training in the differential diagnosis of communicable diseases and a working knowledge of laboratory and statistical procedures. He should have enough assistants in the field to make the division activities effective.

(b) By "clerical" personnel we allude to secretaries and clerical assistants who can handle files, correspondence, and statistical data.

(c) By "field" personnel is meant those members of the staff of the division primarily engaged in procuring epidemiological data, and also the personnel of local health organizations, including the health officer, office assistants, public health nurses, and sanitary inspectors.

(d) The organization of the division of epidemiology should be of such character as to attract and hold competent personnel. There must be security of tenure, the compensation must be creditable, and there must be an opportunity for initiative.

#### REFERENCE

1. The Conference of Epidemiologists (at Johns' Hopkins University School of Hygiene and Public Health, May 12-13, 1927), *A. J. P. H.*, 17, 8: 777 (Aug.), 1927.

# Improved Practical and Economical Methods of Mosquito Control \*

MOSQUITO control, accepted as an important adjunct to the practice of public health engineering and preventive medicine, is steadily growing in scope and magnitude throughout the United States and the world. Whether the problem is one of disease transmission with illness and economic loss to employers and employees, or one of pestiferous proportions with its baneful effect upon human existence and a public health factor through irritation detrimental to comfort and health and reducing industrial efficiency, the demand for effective mosquito control is becoming more universal and is receiving increasing recognition.

Effectiveness is the keynote of successful control operations. Methods by which breeding places may be permanently eliminated—and this is the basic principle of mosquito control—depend, of course, upon local conditions and are thus removed from the application of any specific practice. Breeding places which cannot be disposed of are, however, susceptible to a more or less uniform method of treatment. For this purpose a great variety of oils and larvicides are employed, and frequently through lack of uniformity and suitability of material there is loss of effectiveness and money.

With the view of laying before the Public Health Engineering Section conclusive and constructive recommendations in the practice of control by oiling, your committee undertook the investigation of experiments with oils and oil mixtures to determine the question of suitable specifications.

Until a comparatively recent date practically no definite or conclusive data have been presented on the value of the various oils and oil mixtures and there has been a very limited understanding of their effect upon larval life. For such use there has been an inclination to accept almost any kind of oil available that would cover the surface of water, with the hope that a uniform film would remain long enough to accomplish suffocation—a result formerly held to be sufficient. Certain variations were attempted from time to time, here and there, without uniformity of purpose or results. Of late the question of the

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\* Report of the Committee on Mosquito Control, presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 2, 1929.

need for some toxic agent has demanded attention especially as concerns the control of pupae or securing a necessary rapid kill.

The following theories have been suggested by various investigators to explain the killing effects of oils on larvae.

1. Surface Tension—The physical properties of the oil layer reduce the surface tension so that the larvae are unable to hold themselves to the surface for the necessary breathing period, and drown.

2. Suffocation—The layer of oil acts as a barrier between the larvae and the air, causing suffocation.

3. Oil in Solution—A portion of the oil goes into solution and poisons the larvae.

4. Blocking of Tubes—The oil entering the siphon and tracheal tube, blocks them and impairs respiration.

5. Oils as Contact Poisons—The oil enters the siphon and tracheal tube and acts as a contact poison on tissue.

As a result of more recent investigations there was developed the more logical theory of "Oil Vapors Acting as a Toxic Agent," it being held that the vapor from inspired oils penetrates the tracheal tissue and produces lethal effect.

Outstanding in support of the last mentioned theory are the experiments carried out in New Jersey by Dr. Joseph M. Ginsburg for the State Agricultural Experiment Station which resulted in very definite conclusions recommended by your committee as a decided forward step toward uniformity in the practice of control by oiling. A complete report of these investigations has been published in the *Proceedings* of the Sixteenth Annual Meeting of the New Jersey Mosquito Extermination Association.

The following facts were established:

1. The toxicity of petroleum distillates is in direct proportion to rate of volatility and inversely proportional to the boiling point.

2. From the standpoint of mosquito control, the petroleum distillate oils can be divided into two groups:

Oils of low boiling points and high volatility, possessing high toxicity to larvae and pupae

Oils of high boiling points and low volatility, possessing little or no toxicity

3. Oils boiling from 200 to 550° F. kill larvae and pupae within 30 minutes by exerting a direct toxic effect.

4. Oils of high boiling ranges, such as lubricating and similar oils, act simply by suffocation, the rate of kill being in proportion to the thickness of the film and degree of surface tension.

5. Larvae, whose respiratory siphons are filled with non-toxic oil, do not develop into pupae.

6. Pupae whose trumpets and part of the thorax are filled with non-toxic oil can, under certain conditions, develop into adult mosquitoes.

7. The breathing tubes of larvae and the trumpets of pupae can readily penetrate the thin films of oil that are usually applied on mosquito breeding places.



8. For highly efficient mosquito control in the field the oil must not only form a uniform film but must also be directly toxic to larvae and pupae.

In carrying out the experiments the toxicity and penetration of a number of petroleum oil distillates, varying in boiling point from 200 to 700° F., and of different volatilities and viscosities, were tested on larvae and pupae. An interesting feature of the penetration test was the use of Sudan III which enabled the red stained oil to be traced wherever it penetrated the tracheas of the larvae and pupae.

The experiments also establish the important fact that although larvae containing a poorly toxic oil or non-toxic oil in their breathing siphons cannot develop into pupae, pupae in the same state can produce adults when the oil film breaks, which, to some extent at least, upsets the suffocation theory.

Even though suffocation by the use of non-toxic oils is possible, it would appear that because of the excessive amount of oil required and the great uncertainty of the film remaining intact long enough to accomplish a kill—which is never 100 per cent—for practical and efficient control operations that theory must be discarded in favor of oil vapor as a toxic agent; and the use of oil for any class of breeding restricted to those having a low boiling point and high volatility, making up in quick kill for limited lasting qualities.

If the question of more rigid economy is involved, a mixture of a sufficient amount of highly volatile oil having a boiling point range of say 300 to 500° F. and a high boiling point product such as the cheap waste crank case oil—the final mixture registering a Baumé gravity of 32 to 34°—will give good results as far as spreading and good stable film are concerned. If waste oil is used it is most important that it be very thoroughly strained. For that purpose a series of at least two screens, with the last one not larger than 40 meshes to the inch, is recommended.

The following interesting facts were developed tending to disprove, or indicate the comparative ineffectualness of, one or more of the old theories and supporting the theory of the lethal effect of toxic oils:

1. That volatility and rapidity of kill are inversely proportional to the boiling range, suggests that volatility plays an important rôle. It is also worthy of note that highly volatile oils are strong solvents of fatty tissue.

2. Larvae died before inspired toxic oil reached the sixth segment of the tracheal stems and frequently when but a minute quantity had entered the tip of the tube, showing that lethal effect was produced by the volatile gases penetrating into the tissues, an effect similar to that of ether vapors.

3. Larvae lived several hours after the tracheal stems were completely saturated with non-toxic oils.

4. Variations in the rate of kill of the different non-toxic oils applied under similar conditions.
5. Time required for kill frequently ran into many hours.
6. That a number of other theories have been offered would seem to show that the popular one of suffocation does not always obtain.

In the last analysis, however, oil in any form is not entirely satisfactory. There is need for a larvicide that will thoroughly mix in solution with any water in which mosquitoes may breed and effect rapid kill. To be economical and safe for domestic animals such an agent with its high cost and toxicity should be effective in at least 1 part to 10,000. Experiments along this line are now under way in New Jersey and it is the hope of the committee that similar investigations will be made in other states during the next year.

#### OTHER EXPERIMENTS OF INTEREST

Since the discovery in 1921 of the high toxicity of Paris green against *Anopheles* larvae, the use of that material has steadily increased in malarious regions. Although hand distribution still remains the standard method, several experiments in dusting by airplane to meet the need of more economical methods of application over large areas, have been carried out with a fair degree of success; but that method has not been developed to the point of being recommended for general practice. A further problem has been encountered in the varying degree of toxicity of the several brands of Paris green, which at present renders its use by any method uncertain. The suitability of the material as a larvicide is still maintained and efforts are being directed to the solution of the problems of quality and method of distribution.

In the development of new anti-mosquito agencies it is interesting to note that Robert Matheson and E. H. Hinman, Department of Entomology, Cornell University, recently discovered that the vermilion spotted newt, which occurs throughout the east and central states and Canada, possesses a stupendous appetite for mosquito larvae, a tendency of economic value in fresh water mosquito control if the breeding of this harmless salamander were made a part of the control program.

Recent experiments with *Chara fragilis* are also reported by Dr. Matheson with the statement that ponds in which *Chara* grows normally were found to be continuously free from mosquito larvae; that *Chara* transplanted to aquariums was shown to be lethal to at least four species of mosquito larvae—*C. pipiens*, *C. territans*, *A. vexans*, and *A. punctipennis*; and that a number of successful introductions

were made and found to have the same lethal effect when a vigorous growth was maintained. The results of these experiments are of especial interest in view of the doubt previously expressed in the recorded claim of the efficacy of Chara as a mosquito repellent. Certain other experiments in transplanting Chara which have come to the attention of the committee were unsuccessful because the necessary vigorous growth was not established in the new locations, an important consideration. The committee presents the subject with the suggestion of experiments on a wider scale.

In the matter of general practice in mosquito control your attention is invited to the fact that in an effort to correct the tendency of engineers to "build in" breeding places the Associated Executives of Mosquito Control in New Jersey have petitioned the engineering departments of the state, counties and municipalities, and all licensed engineers, to include in specifications for roadway and similar construction work a clause prohibiting the establishing of borrow pits and other depressions which may become breeding places, and also to provide for suitable drains for areas which would otherwise be locked in.

At the request of that association the State Board of Health has established the rule that all necessary measures must be taken to prevent the breeding of mosquitoes in any part of sewage disposal plants, a medium of mosquito production which has assumed alarming proportions.

The two last phases of practical mosquito control are recommended by the committee for general practice.

LEWIS E. JACKSON, *Chairman*  
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## Social Service in Argentina and Uruguay

THE Museo Social Argentino, an organization for the study of social problems, with headquarters in Buenos Aires, has pointed out the need for modern social service in Argentina; it has recommended the establishment of a school for the training of social workers and has prepared and published a plan for such a school. A similar recommendation has been made in Uruguay.—*Servicio Social*, Santiago de Chile, 3, 4: 311, 1929.

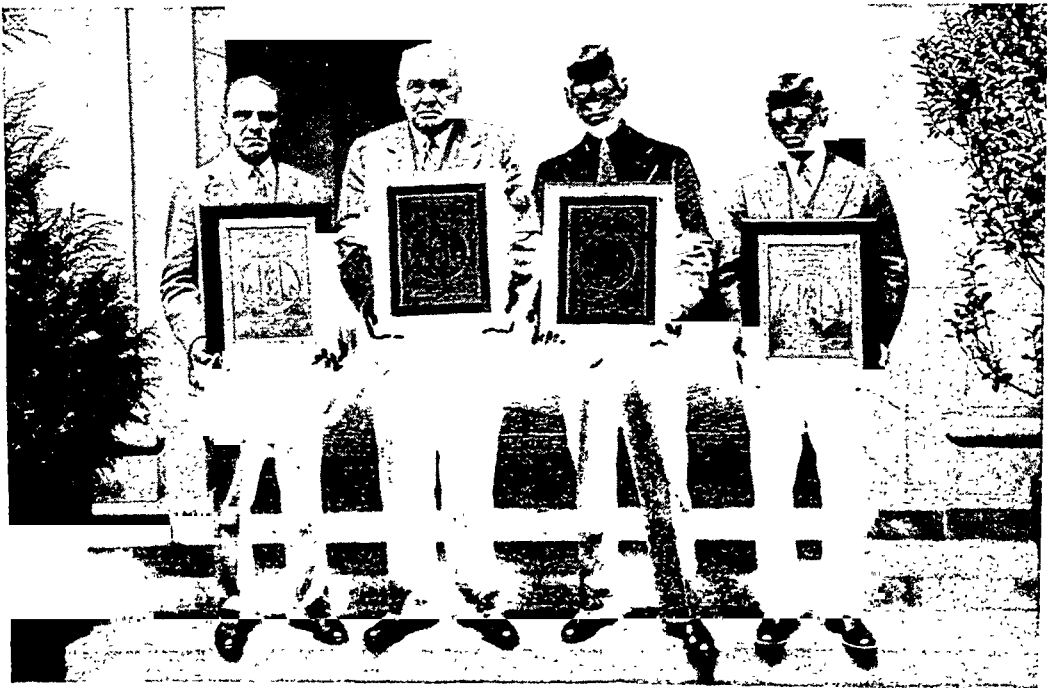
# Inter-Chamber Health Conservation Contest

WILLIAM BUTTERWORTH

*President, Chamber of Commerce of the United States, Washington, D. C.*

AUTHORITATIVE figures on public health show that one out of every four families in the country will have at least one serious illness in the course of a year, and that 2 per cent of our total population is at all times too ill for work. Rough calculations based on these figures, applied to the total annual income in the United States, indicate a direct monetary expense of something like \$2,000,000,000 a year for sickness. Distributing this amount evenly among the 27 million families of the country, it costs the average family the equivalent of \$80 a year through the loss of wages, salaries, cost of necessary medical care, and the like. In addition to this enormous loss, the total capital value of lives prematurely lost has been estimated as aggregating over \$6,000,000,000 annually.

Aside from the humanitarian aspects, these burdens weigh heavily on communities and individuals. There is encouragement in the fact, however, that medical and health authorities of the nation agree that something can be done about it.



1. Frank J. Osborne, Health Officer, East Orange, N. J. 2. John P. Koehler, M.D., Commissioner of Health, Milwaukee, Wis. 3. George C. Ruhland, M.D., Commissioner of Health, Syracuse, N. Y. 4. Edwin G. Ramsdell, M.D., Health Officer, White Plains, N. Y. 5. (Health Officer from Sidney, O., not present.)

Much of the tremendous economic losses resulting from injuries, sickness and death is preventable. Perhaps the major need today is to bring home to the public at large a knowledge of the benefits to be obtained through a promotion of public health education.

Recognizing health education work as a field of vital interest to organizations of business men, the Chamber of Commerce of the United States with the coöperation of the American Public Health Association, the National Association of Life Underwriters, and the U. S. Public Health Service, as early as 1926 began to work on a health conservation program. As a result of the success achieved in this field evidenced by the reports of active participation from many chambers of commerce, and encouraged by the accomplishments that have been made by insurance companies, industrial concerns and other organizations, our Seventeenth Annual Meeting last year adopted a resolution which declares:

In order to conserve life and health to the fullest extent there should be further development of national interest and of national activity. In efforts directed to this purpose the Chamber should participate and should enlist the widest possible coöperation on the part of its membership.

In carrying out this expression of our organization members, an Inter-Chamber Health Conservation Contest was launched in order to give the health activities of the member commercial organizations the stimulus of competition. The Contest, to be under the direction of the Chamber's Insurance Department Committee and Insurance Department, was announced on June 20, 1929.

From the very beginning of its health program the Chamber has realized that but little could be accomplished without the help of organizations interested in the technical aspects of such work. In the Health Contest the need of such assistance has been especially apparent and the enthusiastic coöperation and aid of the Committee on Administrative Practice of the American Public Health Association has been most valuable. Through the financial help of a number of member insurance companies of the National Chamber, the American Public Health Association, through its technical experts, has been enabled to render consultant service to nearly 100 of the contestants.

Local chambers, moreover, have been encouraged to seek the aid and coöperation of their local public officials and other public health agencies. Without their help it was felt that advance in local health conservation achievements would be of but little moment. On the other hand, the local health officials and agencies when backed by the wholehearted support of the business men of each community can increase the effectiveness of their efforts. Coöperation between local public health agencies and local business men has been the keynote of the Contest.

Planned generally to be from January 1 to December 31 inclusive, the period of the Health Contest during the initial competition of 1929 was made retroactive to January 1, though entry was allowed at any time during the year. The success of the Contest may be judged by the fact that, for 1929, more than 130 cities, representative of 38 states, the District of Columbia and the territory of Hawaii, participated. Of these cities 108, representing 30 per cent of the urban population of the United States, sent in records of their 1929 health conservation activities. Interest manifested in the Contest to date has been beyond all expectations. But from even a casual appraisal of the benefits to be gained, it is not surprising after all that so many communities should wish to take part in the movement.

In order that none of the participants in the Contest might be unduly handicapped, the various communities have only competed with those in comparable population classes. The population classes are as follows: Class I, over 500,000

population; Class II, 100,000 to 500,000 population; Class III, 50,000 to 100,000 population; Class IV, 20,000 to 50,000 population; Class V, under 20,000 population. Recorded activities of contestants in the various population classes have been most excellent, and it is felt that many with reports only slightly below the winners deserve recognition. In each population class, the first 5 cities following the winner have been given honorable mention and will receive engraved certificates.

It is a pleasure to give the names of these honor cities:

*Class I*—Detroit, Mich., Philadelphia, Pa., San Francisco, Calif., Brooklyn and Buffalo, N. Y.

*Class II*—New Haven, Conn., Rochester, N. Y., Cincinnati, O., Yonkers and Albany, N. Y.

*Class III*—Rockford, Ill., Pasadena, Calif., Racine, Wis., Harrisburg, Pa., and Greensboro, N. C.

*Class IV*—Cumberland, Md., Alhambra, Calif., Aurora, Ill., Durham, N. C., and Santa Ana, Calif.

*Class V*—La Salle, Ill., South Orange, N. J., Eureka, Kans., Palo Alto, Calif., and Natchitoches, La.

Certainly these cities are representative of the country as a whole and it is my sincere hope that the progress made in health conservation during the first year of the Contest will spur them to greater efforts and successes in the future.

It now becomes an added pleasure to present the awards to the winners in each of the population classes. (Mr. Butterworth then proceeded to present the award—a large bronze plaque—to each of the five winning cities: Milwaukee, Wis.; Syracuse, N. Y.; East Orange, N. J.; White Plains, N. Y.; and Sidney, O. Brief speeches of acceptance were made. Two of these follow.)

## Acceptance Address

JOHN P. KOEHLER, M. D., F. A. P. H. A.

*Commissioner of Health for the City of Milwaukee, Wis.*

IN accepting this health award, for the City of Milwaukee, I do so not only as the head of the Milwaukee Health Department, but also as the representative of the city administration, the local Association of Commerce, the private and public welfare, health, and educational agencies, and many others that have contributed their share toward the health program that has brought this great honor to Milwaukee.

Though ever mindful of our shortcomings, we are proud of the recognition given Milwaukee and thankful to the Milwaukee Association of Commerce for entering our city so successfully in this contest. We are grateful to the Chamber of Commerce of the United States for instituting the Inter-Chamber Health Conservation Contest, not only because it has made it possible for us to have our health work of the present favorably appraised by competent and impartial judges, but even more so because such a contest conducted annually among the cities of this country will stimulate all of us to greater effort in the future.

Many events have occurred in the past that have given a new impetus to health conservation work, but I do not know of any event that has inspired us all with more optimism for the future than the announcement that the business men of our country have enlisted their organizations in disease prevention and health promo-

tion work. I believe that the year 1930 will be the beginning of a new epoch in public health work. It will be the beginning of health work that is based more on sound economic principles than upon spasmodic sentimental efforts.

I do not know of any organization that should be more interested in the conservation of our nation's resources than the National Chamber of Commerce. Our resources do not consist solely of real estate, machines and manufactured products. There is no greater national asset than human capital. According to a well known statistician, our vital or human capital exceeds our material wealth about five to one.

However wasteful we may be with our material wealth and our natural resources, it is not to be compared to our wastefulness of human lives. Sickness, alone, costs our country \$2,250,000,000 annually. One hundred twenty thousand babies, with a capital value of \$750,000,000, die annually from preventable causes. Every year more than 30,000 young men and women between the ages of 25 and 29 with potential net future earnings of \$750,000,000 die due to their own ignorance and the indifference of the communities in which they live.

It is estimated by those who have given a great deal of study to our annual mortality figures that lives valued at over \$6,000,000,000 can be saved annually through the intelligent expenditure of comparatively small amounts of money. One of our large life insurance companies reports a saving of \$43,000,000 through the expenditure of \$20,000,000 on health education and nursing service among its policy holders. The statistician of this company writes: "There is no greater opportunity for a quick and more certain return on any investment than an investment in public health." It is estimated that if \$2.50 per capita were wisely spent against the preventable diseases and for public health education, our annual death rate could be reduced 20 per cent and our expectancy of life increased from 5 to 7 years.

Public health work is still in its infancy in spite of its marvelous achievements of the past and its great possibilities of the future. There are still many communities that depend upon the crumbs falling from the table of the budget makers for the development of a public health program. They have not yet learned that public health within certain limitations can be purchased with the taxpayers' money. There are still communities that select their health officers according to their political affiliation and qualification.

There are also many communities that prefer to spend millions for the treatment of disease in hospitals, sanatoriums, asylums, and penal institutions rather than to spend thousands for prevention of disease. Dr. Dublin in his book *Health and Wealth* very aptly writes: "A new era of intensive public health work must be brought about, which will make available to the American people the power of this new branch of science. The people of the United States and in fact of the whole world have not waked up to the enormous possibilities of profit in preserving life and health."

I believe that the National Chamber of Commerce has finally started us on this new era of intensive public health work, of which Dr. Dublin writes, and you as members of this great organization are to be congratulated for inaugurating a public health policy which will very likely be the beginning of a public health renaissance. On behalf of Milwaukee, I again beg to express to you, Mr. President, and to the Members of the Chamber of Commerce of the United States my most sincere appreciation for the recognition given our city. I assure you that we shall not rest on our laurels, but shall make a greater effort than ever to make our city, our state, and our country safer and more healthful.

## Acceptance Address

FREDERICK C. McLAUGHLIN

Mayor, White Plains, N. Y.

THE people of White Plains express their deep appreciation of the honor which you have conferred upon them by this award.

We come to receive it in no spirit of unseemly pride or truculent boasting, but rather as members of a great fellowcraft, and coworkers in the cause of local self government.

Whatever our city, and the great County of Westchester, of which we are the heart and center, has been able to accomplish in budgeted planning, public works, public health and recreation, and good local government, is, after all, but our modest contribution to better citizenship, and better local government in America. We touch elbows with you in ideals and purpose. If, as Professor Hocking says, the ultimate purpose of the state is the making of men, then the practical accomplishment of that purpose begins with the local unit, in the community where the citizenship of state and nation is in the making, and where the people are united by strong ties of local civic pride and common interests.

Our ideal of local government is that which unites the people in coöperative effort along constructive lines, on the highest common plane, for the common good.

Our creed is that proclaimed by Judge Cooley, in his great book *Treatise on the Constitutional Limitations*, that local self government has been historically, and is today more than ever, the very cornerstone of our free institutions.

The splendid Health Department of the fine City of Syracuse has been richly endowed under the Milbank Foundation. We are similarly fortunate. Our Health Department might well be known as the Dr. Edward G. Ramsdell Foundation. A physician and surgeon of great eminence in his profession, an overseas man, the head of the medical staff of our fine hospital, an over-busy, active man with wide and varied interests, Dr. Ramsdell has for nearly twenty years given freely of his time and great talents to the upbuilding of a model local health unit in our city. That department stands as a monument to him.

What shall we say of such a service? Perhaps George Santayana, in his little classic, *The Sense of Beauty*, has said it for us, when he wrote—"The aesthetic demand for the morally good is, perhaps, the finest flower of human nature."

Not the demand of fear, caution or inhibition, but the spontaneous, pleasurable (and, therefore, aesthetic) demand for the morally good, prompted this service.

When a great physician breaks loose from the selfish allurements of a metropolitan career, to spend and be spent for the common good, with no hope of material reward, we have an example of the finest type of citizenship which local self government and our free institutions can produce. I would gladly travel from White Plains to Washington at any time, to pay my tribute to such a man.

The honor which you confer today upon our city is the hall mark now placed by your great organization upon his splendid gift to White Plains.

We accept the award. We shall hang the trophy in a conspicuous place upon the walls of our Council Chamber as a lasting token and reminder to the people of White Plains of one who stands as an example and as a challenge to the oncoming youth of our city.

I request that Dr. Ramsdell, who is present with me on this platform, receive the trophy in person.



## EDITORIAL SECTION

*Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.*

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## PROGRESS ON FEDERAL HEALTH CORRELATION

WHEN, on April 9, 1930, President Hoover signed H. R. 8807, known as the Parker Bill, this event marked the culmination of more than five years of efforts to bring about some effective coördination of federal health activities. This new law actually does more to improve the internal administration and advance the scope of activities of the U. S. Public Health Service than it achieves in the way of making possible the correlation of our scattered federal health work, but it is, nevertheless, a notable step in the right direction and it represents real progress.

The outstanding features of this law are its provisions for the detail of personnel of the U. S. Public Health Service to other government departments performing health work, when such detail is requested by department heads; the detail of the personnel of the Service to educational and research institutions, and the reciprocal right to offer to qualified scientists the facilities of the Hygienic Laboratory in Washington, D. C.; the establishment of new divisions of chemistry, zoölogy, and pharmacology at the Hygienic Laboratory; the granting of a commissioned status to sanitary engineers, dentists, and other qualified non-medical scientists; an increase in rank and pay for the Surgeon General; and the enlargement of the present Advisory Board of the Hygienic Laboratory to become a national advisory health council. In addition, there are a number of desirable provisions regarding the appointment and promotion of the personnel of the U. S. Public Health Service.

This is essentially the same measure that was adopted by Congress in 1928 but was vetoed by President Coolidge on May 18 of that year. The President gave as his reason for this action the fact that the measure tended to give a military status to officers engaged in scientific pursuits, and took away from the President the right to make certain appointments and thus was unconstitutional. About the only concessions made to this point of view in the present bill were some minor changes in phraseology and the omission of the provision for a much needed Nurse Corps in the Service.

That it should require five years to secure ratification of an important piece of national health legislation is an interesting commentary on government progress in health matters. The agitation for better federal health correlation began late in 1924 at a dinner attended by a group of eminent public health workers, presided over by Dr. Livingston Farrand. Shortly thereafter, a committee went to President Coolidge and urged upon him the desirability and necessity for action in this regard. The President suggested that authentic facts be first gathered. Accordingly, arrangements were made with the Institute for Government Research of Washington, D. C., for a comprehensive survey of federal health work, and the result was a 423-page book,<sup>1</sup> which not only reported and discussed every phase of existing federal health work, but offered a comprehensive and practical plan for co-ordination. Later, an independent study appeared, with still another proposition.<sup>2</sup>

This scheme of the Institute for Government Research, having the support of the American Public Health Association and other public health, medical, and civic organizations, was presented by a committee to the President on January 14, 1926. Pursuant to his suggestion, a bill embodying many of its salient features was prepared and was introduced in the House of Representatives by Hon. James S. Parker of New York. Due to opposition manifested by the then Director of the Budget, another year elapsed before hearings were held on the bill. By that time opposition had also developed against the first section of the measure, which would have empowered the President to detail by executive order officers and scientific personnel of the U. S. Public Health Service to assist or direct the health work of other bureaus. When the bill was finally reported, this important section, which would have resulted in real coördination, had been deleted.

In this emasculated form, though still carrying other highly significant provisions, the Parker Bill passed both houses of Congress, only to be vetoed by President Coolidge, along with seven other meas-

ures which incurred his disapproval. Congress promptly re-passed three of these bills, but took no action on the equally important Parker Bill. As was poignantly stated<sup>1</sup> in our Law and Legislation Section shortly thereafter, "triumph for public health is only postponed, not prevented," and subsequent events have demonstrated that persistence in the promotion of essential national health legislation eventually gets results. Public health has a long heritage in the matter of overcoming obstacles, especially when they are unreasonable.

In the thorough and interesting debate on the current bill in the House of Representatives on March 26, 1930, the statement was made that "the Public Health Service is one of the greatest services of the Government,"<sup>2</sup> a sentiment which seemed to meet with general approval in that national legislative body. There was also well merited praise for Surgeon General H. S. Cumming and the entire personnel of the Service. In the Senate, where the bill was passed on April 1, 1930, there was, strangely enough, no debate.

It is, of course, gratifying to the American Public Health Association, which passed resolutions in favor of the principles of the Parker Bill at four of its annual conventions, to be able finally to record the success of this measure. The officers, editors, and legislative committee of the Association did valiant work in helping to bring about this result, which cannot help but be fruitful to the great cause of national vitality, to the promotion of which the efforts of all of us are dedicated.

#### REFERENCES

1. Tobey, James A. *The National Government and Public Health*. Johns Hopkins Press, 1926.
2. Leigh, Robert D. *Federal Health Administration in the United States*. Harpers, 1927.
3. A. J. P. H., Law and Legislation Section, July, 1928, p. 949.
4. *Congressional Record*, Mar. 26, 1930, p. 6385.

#### ACCEPTED FOODS

THE Council on Pharmacy and Chemistry of the American Medical Association has announced the establishment of a Committee on Foods. Products which are reviewed and approved by the committee will be admitted to the advertising columns of the publications of the American Medical Association and listed in a *Book of Accepted Foods*.

The *Journal of the American Medical Association* commented editorially:

It is the hope of the committee that its efforts will give stability to a rapidly growing industry and prevent the sinking of the modern food market in a morass of hokum such as engulfed the drug industry in its developing stages.

There is no doubt whatever that a field exists for such an agency. The members of the public health profession will watch the pro-

nouncements of the committee with much interest and will give it their full support.

There is little probability that the American Medical Association will build up around the acceptances of food products the rules and regulations found necessary to protect the public against nostrums and drugs. Presumably all foods have some food value, whether or not they are advertised for health, and it is doubtful whether they would have a deleterious effect upon the health of consumers. This cannot be said of proprietary medicines, some of which are decidedly harmful.

Almost simultaneously with the announcement of the new Food Committee, the press reported that "the use of the word 'health' in connection with foods constitutes a misbranding under the food and drugs act," according to Paul B. Dunbar, Assistant Chief, Food, Drug and Insecticide Administration, U. S. Department of Agriculture. The action of the A. M. A. and the stand of the Food, Drug and Insecticide Administration apparently have no connection, but it is interesting to observe the present trend.

The public health profession has built up the public consciousness to a realization of the value of milk as a food, the benefits derived from a widespread use of orange and tomato juice and of an increased consumption generally of fresh vegetables and fruits. The profession is undoubtedly responsible for the recognition by the public of many food products that now enjoy great popularity. Far-sighted manufacturers and distributors have appreciated for a long time that the right information and attitude of mind on the part of health authorities are essential in assuring the success of any worthy food product.

Health workers through health education and the other means in their power always have drawn a line of distinction between foods of determined value and those whose advertising claims cannot be defended. The Committee on Foods and the Food, Drug and Insecticide Administration will back these previously expressed opinions by official action. It is hoped that the activity of these two groups will result in the further acceptance by the public of those things to which the public health profession has already given its endorsement.

### THE HEALTH CONTEST AWARDS

IT is an auspicious day for public health when the leaders of American business pause in their deliberations of major economic problems to recognize and pay tribute to successful health administration. This happened on May 1 in Washington, D. C., at the Annual Meeting of the Chamber of Commerce of the United States, when awards in the first Inter-Chamber Health Conservation Contest were made.

The speech of the president of the National Chamber who personally presented the awards is printed on another page of this issue of the JOURNAL. Two of the brief speeches of acceptance made by representatives of the winning cities are also printed. The remarks of Dr. Koehler, Commissioner of Health of Milwaukee, which was the winner of the award for cities of the first class, are quite generally representative of the attitude of the health officers of cities entered in the contest. The remarks of the Mayor of White Plains, winner among cities of the fourth class, are especially noteworthy. His eulogy of the health officer of White Plains will be appreciated by all health officers who have had to face an often unsympathetic city council.

If the Contest does nothing more than secure for the health officers of the country the enthusiastic interest and support of the local councils it will have served an important purpose. If in addition it can direct to the advancement of public health administration, the organized community enthusiasm which has heretofore been principally expended on industrial development or the attainment of commercial supremacy, then a new era is dawning for the health officer.

# ASSOCIATION NEWS

## THE FIFTY-NINTH ANNUAL MEETING

FOR the first time in its history the Association will hold its Annual Meeting in Texas. The meeting will be extended to include four days in Mexico City. Twice before the Association has met in Mexico City, once in 1892—the 20th Annual Meeting—when Felix Formento, M.D., of New Orleans was president, and again in 1906—the 34th Annual Meeting—when Franklin C. Robinson, LL.D., of Brunswick, Me., was president.

Were the delegates to take advantage of all the courtesies and privileges offered by the very hospitable Texans, the meeting would last through to the end of the year. The Local Committee has planned many trips both for pleasure and for scientific interest.

There will be trips to various cities in Texas, among which will be Austin, the capital, with its many points of interest—the beautiful state capitol, the French Embassy built in 1841 from hand-sawn lumber to house the Ambassador from the Republic of France to the Republic of Texas, and the old Land Office now occupied by the Daughters of the Republic of Texas and the United Daughters of the Confederacy. It was in 1836 that Texas was declared free and independent of Mexico and became a republic; however, ten years later upon invitation from the United States she voluntarily joined the Union.

Delegates will also visit San Antonio, one of the oldest cities in our country. Here is located the famous Alamo (Mission of San Antonio de Valero) established in 1718, but later reconstructed as the Mission San Jose, in which are some of the original carved statues and

paintings sent to America by the King of Spain, and carried through the wilderness by the early fathers. Many other Texas cities have extended invitations. An unusual feature this year will be a rodeo and barbecue at Fort Worth.

The scientific program is taking form and promises to be very complete. The many problems of the modern health officer will be discussed, such as noise prevention, the effects of the obstruction of sunshine in our big cities, smoke, ventilation, etc. Cancer will have a prominent place on the program.

There will be a special session on preventive medicine from the viewpoint of the practicing physician. The reports of committees are always an important feature since these are the results of careful investigation and research, and in general are far more interesting than the name "report" implies. There will be symposiums on undulant fever, typhoid fever, and metals in foods, and a special session on meningitis, with possibly one on psittacosis.

At the Fort Worth meeting, A. J. Chesley, M.D., the president for this year, will go out of office; the President-elect, Hugh S. Cumming, M.D., will become president; and a new President-elect will be chosen.

The Mexican Department of Public Health is sending a delegation of six representatives who will present papers at various section meetings. Dr. Rafael Silva, Director of Public Health in Mexico, will address the General Session on Monday evening.

Besides very good railroad service, there are many automobile roads for

those who may drive to Fort Worth. The Convention and Publicity Bureau of the Fort Worth Chamber of Commerce distributes a map showing the roads through Texas.

It is hoped that there will be a very large attendance. It would certainly be difficult to find a more enthusiastic host than we shall visit for the 1930 Annual Meeting.

GUY L. KIEFER DIES

Guy L. Kiefer, M.D., Health Commissioner of the State of Michigan since March, 1927, died on May 9 of heart disease. He was a Charter Fellow of the A. P. H. A., elected in 1923; and a member since 1907. He was Health Commissioner of the City of Detroit from 1901 to 1913 and during this time the Herman Kiefer Hospital was



built and named for his father. Later, and until his last appointment, he served as president of the advisory council of the State Department of Health. Dr. Kiefer has served in many positions in connection with the A. M. A., the Michigan State Medical Society, Wayne County Medical Society, Michigan Public Health Association, and the Detroit College of Medicine. He was Vice-Chairman of the Public Health Administration Section of the American Public Health Association in 1924-1925, and has been the Michigan Public Health Association representative on the A. P. H. A. Governing Council since 1927.

..... (Cut off on this line) .....

HOTEL RESERVATION BLANK FOR FORT WORTH MEETING

To .....  
(Name of Hotel)

Please reserve for me.....rooms for.....persons  
for the A. P. H. A. Meeting. (Cross [X] is placed after my preference.)

Single room.....Double room.....

Maximum rate per day for room \$.....Minimum rate per day for room \$.....

I expect to arrive..... If date of arrival is changed I will notify  
you at least 24 hours in advance.

Please acknowledge this reservation.

Name .....

Street Address .....

City ..... State .....

## ANNUAL MEETING—INFORMATION

## FORT WORTH HOTELS

For the convenience of delegates, a number of Fort Worth hotels are listed with their rates. A map of the business section of the city shows the location of some of the hotels, theatres, churches, and other buildings which delegates may desire to reach (page 646).

A blank is printed on page 644 which it is suggested that you use to engage your rooms well in advance of the meeting. All applications for reservations should be made directly to the hotels.

## REDUCED RAILROAD RATES

A rate of one and one-half times a one-way fare from starting point to Fort Worth will be granted to those attending the Fifty-ninth Annual Meeting, October 27-30.

Do not purchase a return ticket. When purchasing your one-way full fare ticket to Fort Worth, ask the ticket agent for a reduced fare certificate. This you may have validated by the Executive Secretary at Fort Worth and thereby obtain your return ticket at one-half the usual rate.

The reduction is available to all dele-

gates and members of their families attending the Annual Meeting.

Detailed information regarding transportation will be sent to all members of the Association early in September.

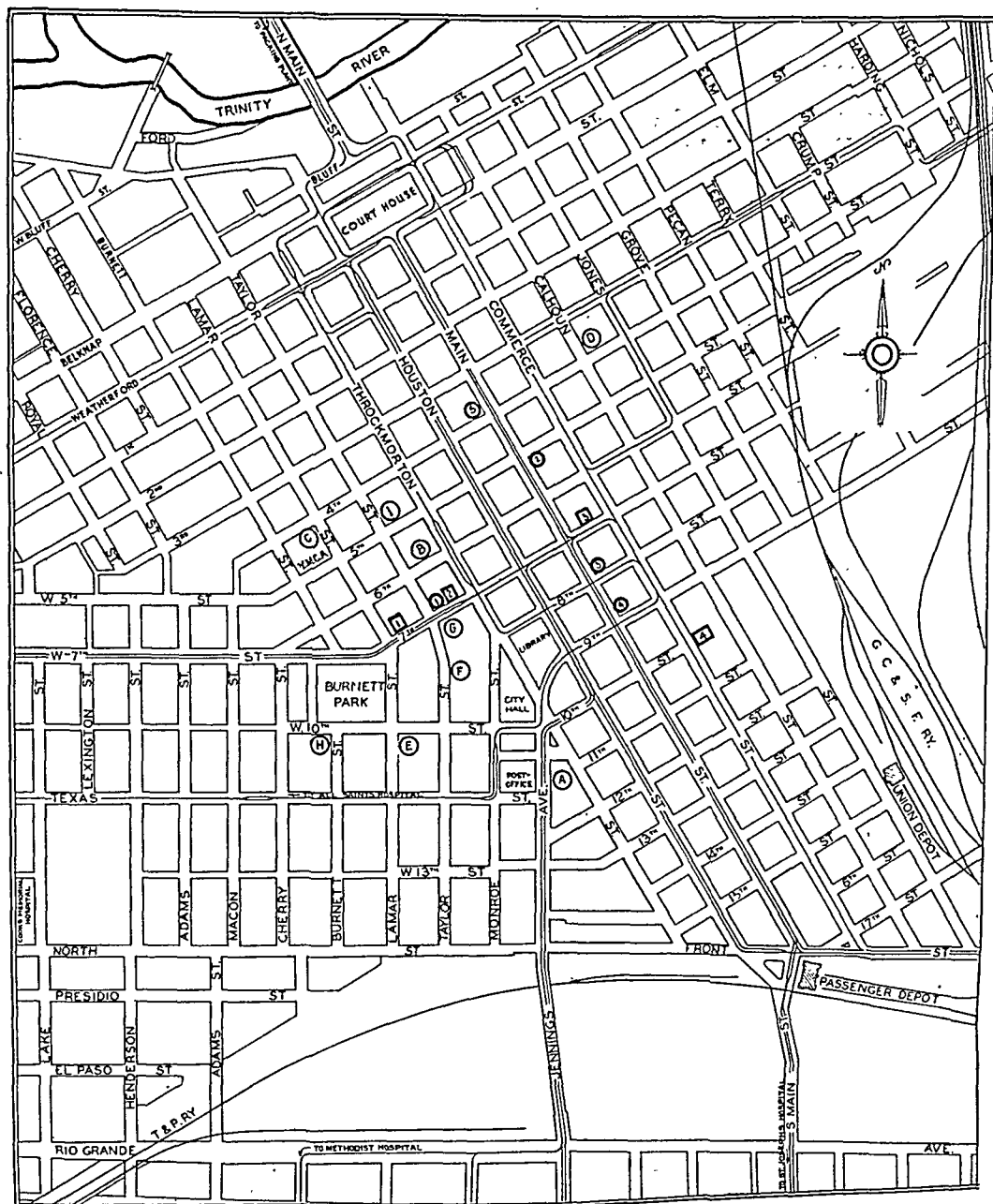
RAILROAD RATES FROM VARIOUS CENTERS  
TO FORT WORTH

	Regular Rate One Way	Special Rate Round Trip	Lower Berth	Upper Berth
Atlanta, Ga. ....	\$31.32	\$ 46.98	\$10.13	\$ 8.10
Baltimore, Md. ....	53.00	79.50	15.38	12.30
Boston, Mass. ....	66.93	100.40	19.50	15.60
Buffalo, N. Y. ....	50.13	75.20	15.00	12.00
Chicago, Ill. ....	34.36	51.54	12.00	9.60
Cincinnati, O. ....	35.99	53.99	12.00	9.60
Cleveland, O. ....	43.57	65.36	13.50	10.80
Dallas, Tex. ....	1.14	1.71	.....	.....
Denver, Colo. ....	28.84	43.26	9.00	7.20
Detroit, Mich. ....	42.23	63.35	12.75	10.20
Indianapolis, Ind. ....	33.34	50.01	10.88	8.70
Jacksonville, Fla. ....	38.22	57.33	12.75	10.20
Kansas City, Mo. ....	17.82	26.73	6.38	5.10
Los Angeles, Calif. ....	51.68	77.52	15.38	12.30
Louisville, Ky. ....	31.69	47.54	10.13	8.10
Memphis, Tenn. ....	17.99	26.99	6.38	5.10
Minneapolis, Minn. ....	35.50	53.25	12.00	9.60
Nashville, Tenn. ....	26.57	39.86	8.63	6.90
New Orleans, La. ....	20.32	30.48	6.38	5.10
New York, N. Y. ....	59.70	89.55	17.63	14.10
Omaha, Neb. ....	24.99	37.49	8.25	6.60
Philadelphia, Pa. ....	56.46	84.69	17.25	13.80
Pittsburgh, Pa. ....	46.71	70.07	14.25	11.10
Portland, Ore. ....	78.30	117.45	24.00	19.20
Salt Lake City, Utah. ....	48.46	72.69	15.38	12.30
San Francisco, Calif. ....	63.30	94.80	19.13	15.30
Seattle, Wash. ....	83.03	124.55	24.00	19.20
St. Louis, Mo. ....	24.47	36.71	8.25	6.60
Toronto, Can. ....	50.13	75.20	15.38	12.30
Washington, D. C. ....	53.00	79.50	15.38	12.30

## FORT WORTH'S HOTELS, SHOWING LOCATION, NUMBER OF ROOMS, AND RATES

	Location	Rooms	Rates—Single	Rates—Double
Texas .....	Main & 8th	600	\$2.00 to \$5.00	\$4.00 to \$7.00
The Worth .....	7th & Taylor	300	2.00 to 4.00	3.50 to 6.00
Blackstone .....	Main & 5th	300	2.50 to 5.00	4.00 to 7.00
Westbrook .....	408 Main	300	1.50 to 4.00	2.75 to 6.00
Terminal .....	1616 Main St.	200	1.00 to 2.50	1.50 to 3.50
Metropolitan .....	Main & 9th	200	1.50 to 3.00	2.00 to 4.00
Seibold .....	7th & Commerce	125	1.50 to 3.00	2.00 to 4.00
Majestic .....	1305A Main	70	1.00 to 1.50	2.00 to 2.50
Madoc .....	1313 Main	70	1.00 to 2.50	1.50 to 3.50
Mohawk .....	15th & Calhoun	65	1.00 to 2.00	1.50 to 3.00
Commercial .....	505 Main	50	1.50 to 2.50	2.00 to 5.00
Melba .....	1107 Houston	78	1.00 to 2.00	2.00 to 3.50





## CITY OF FORT WORTH BUSINESS SECTION

## HOTELS

- (1) Worth
- (2) Blackstone
- (3) Texas
- (4) Metropolitan
- (5) Westbrook

## THEATRES

- [1] Hollywood
- [2] Worth
- [3] Palace
- [4] Majestic

## CHURCHES

- (A) Catholic
- (B) 1st Christian
- (C) Christian Science
- (D) Church of Christ
- (E) Episcopal
- (F) Hebrew
- (G) Methodist
- (H) Methodist
- (I) Presbyterian

Hotels are indicated on the map by numbers in circles, theatres by numbers in squares, and churches by letters in circles.

## NEW MEMBERS

*Health Officers Section*

- Robert E. Fox, M.D., A.B., Asheville, N. C.,  
County Health and Quarantine Officer  
Oscar L. Rogers, M.D., Sandersville, Ga., Com-  
missioner of Health, Washington County  
Melvin M. Bolland, Everett, Wash., Deputy  
Health Officer  
Frank Deason, M.D., Los Angeles, Calif., Asst.  
Health Officer  
John S. Fox, M.D., Los Angeles, Calif., Asst.  
Health Officer  
William C. Finch, M.D., Los Angeles, Calif.,  
Deputy Health Officer  
H. Manning Elliott, M.D., Los Angeles, Calif.,  
Deputy Health Officer  
Dr. George F. Schmelzel, Los Angeles, Calif.,  
Asst. Health Officer

*Laboratory Section*

- Taylor Rogers, B.S., Oklahoma City, Okla.,  
State Chemist, Department of Health  
Evelyn L. Brown, B.A., Paterson, N. J., Chem-  
ist, Board of Health  
Malcolm H. Soule, Sc.D., LL.D., Ann Arbor,  
Mich., Assoc. Professor of Bacteriology,  
Medical School, University of Michigan

*Public Health Engineering Section*

- Frederick Shepperd, New York, N. Y., Pub-  
lisher, *Municipal Sanitation and Water  
Works Engineering* (Assoc.)  
Karl M. Mann, New York, N. Y., Publisher,  
*Municipal Sanitation and Water Works En-  
gineering* (Assoc.)  
Howard R. Fullerton, B.S., Nashville, Tenn.,  
Sanitary Engineer, State Department of  
Public Health  
Alexander L. Thomson, Wishaw, Scotland,  
Chief Sanitary Inspector (Assoc.)  
Carl S. Boettger, Darby, Pa., Sewerage and  
Sewage Disposal and Industrial Waste  
Treatment  
Alfonso Villa-Acosta, C.E., Mexico City, Mex.,  
Engineer, Water Works Department  
Joseph Rady, C.E., Waco, Tex., Consulting  
Sanitary Engineer  
Frederick E. Giesecke, College Station, Tex.,  
Texas Engineering Experiment Station  
Homer G. Olmsted, El Paso, Tex., Sanitary  
Engineer  
Edgar J. Hood, B.S., Laredo, Tex., Filtration  
Plant Superintendent  
John W. Cunningham, Calallen, Tex., Chief  
Engineer, Corpus Christi Purification Works  
Milton M. Miller, B.S., Vancouver, Wash.,  
Milk Investigations, U. S. P. H. S.

*Industrial Hygiene Section*

- L. G. Bean, D.D.S., Columbus, O., Chief, Bu-  
reau of Dental Hygiene  
Willard J. Denno, M.D., Dr.P.H., New York,

N. Y., General Medical Director, Standard  
Oil Company

Rudolph C. Engel, M.D., Cleveland, O., In-  
dustrial Physician, Corrigan, McKinney  
Steel Company

F. D. Sweger, Los Angeles, Calif., Director,  
Bureau of Housing and Sanitation, City  
Health Department

*Food, Drugs and Nutrition Section*

Richard S. Craig, B.S., Baltimore, Md., Di-  
rector, Bureau of Chemistry and Food, City  
Health Department

George J. Galloway, Los Angeles, Calif., Bu-  
reau of Housing and Sanitation

*Child Hygiene Section*

Mary E. Crawford, M.D., Winnipeg, Man.,  
Chief Medical Inspector, Winnipeg Public  
Schools

John C. Bergmann, D.D.S., Chicago, Ill., Ex-  
amining Dental Surgeon, Chicago Schools

*Public Health Education Section*

John R. Neal, M.D., Springfield, Ill., Secre-  
tary, Medical Examining Board

Arthur Geiringer, M.D., New York, N. Y.,  
Associate Medical Director, Equitable Life  
Assurance Society

Walter F. Cobb, M.D., Baltimore, Md., For-  
merly Director of Health and Physical Ed-  
ucation, Baltimore Public Schools

Mabel L. Morgan, B.S., Saginaw, Mich., Ru-  
ral School Nurse

*Public Health Nursing Section*

Maud A. Tollefson, R.N., Flat River, Mo.,  
Chief Nurse, St. Francois County Health  
Department

Monica Moore, R.N., New York, N. Y., Terri-  
torial Supervisor, Metropolitan Life Insur-  
ance Company

Isabelle E. Carruthers, R.N., St. Louis, Mo.,  
Territorial Supervisor, Metropolitan Life  
Insurance Company

Katherine Collar, Chicago, Ill., Public Health  
Nurse

Louise Steele, Chicago, Ill., Public Health  
Nurse

Alma K. Hagguist, R.N., Austin, Tex., State  
Supervising Nurse, Department of Health

*Unaffiliated*

Robert F. Knox, Poughkeepsie, N. Y. (Assoc.)  
Y. L. Mei, M.D., Dr.P.H., Nanking, China,  
Commissioner of Health (Assoc.)

Albert R. Buchmeier, East Paterson, N. J.,  
Sanitary Inspector, and Registrar of Vital  
Statistics

William H. Walsh, M.D., Chicago, Ill., Con-  
sultant on Hospital Planning

Harley T. Corson, Chicago, Ill., Executive  
Manager, National Food Bureau (Assoc.)

# PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

**Cost of Medical Care**—Through its nursing service the Metropolitan Life Insurance Company has obtained figures indicating the amount of money spent for medical care by industrial policy holders. Record has been kept for a period of 6 months for 3,281 families consisting of 17,129 individuals. During the 6 months from January to June, 1929, \$230,907.00 was expended for medical care or an average of \$70.00 per family for the 6-months period or \$140.00 a year. Six per cent of the families reported no expenditure; 40 per cent spent less than \$25.00 each; 80 per cent paid out less than \$100.00 each; 1 per cent expended \$500.00 and over.

The largest share of the money paid out, 43 per cent of the total, went to doctors' fees. Eighty-two per cent of the families had a private physician at one time or another during the 6-months period, while 83 per cent of the families purchased medicines. Hospitals, although used by only 1 family in every 7, accounted for 12.5 per cent of the total amount expended. Families that had the services of a private physician paid him on an average \$37.00 over a period of 6 months. Those that required hospital care paid an average of \$60.00 for this service, and those that had operations paid an average of \$74.00 for this special service.—Lee K. Frankel, *Cost of Medical Care Bulletin* of the Metropolitan Life Insurance Company, 1930.

**Tuberculosis in New York City**—The tuberculosis death rate in New York City remains high, especially among women from 20 to 25 years and men from 60 to 70. In certain congested sanitary areas the rate still ex-

ceeds 300. During the period from 1898 to 1927 the general tuberculosis death rate declined 70 per cent, from 282 to 86. Since 1921 the rate has remained in the neighborhood of 90 per 100,000 due to many influences, largely economic and racial.—G. J. Drolet, *J. Prev. Med.*, 4: 115 (Mar.), 1930.

**Tuberculosis in New Haven**—The New Haven Board of Health was created in 1872, at which time tuberculosis was the most important single cause of death. This disease was made reportable in 1905. In 1910 the Health Department started a survey of tuberculosis cases in New Haven which resulted in the establishment of the Municipal Dispensary in 1920 which continued until the latter part of 1926, when the present Bureau of Tuberculosis was organized, thus establishing a unique tuberculosis program.

Of the 1,800 known living cases of tuberculosis in New Haven only 20 per cent have been reported by private physicians, the remainder having been discovered through dispensaries and hospitals. At the present time there are 1,162 available beds for tuberculosis in Connecticut representing approximately 1 bed for each annual death. There is, however, a waiting list in excess of 300.

According to the standard of the *Appraisal Form* of the American Public Health Association, a municipality should have not less than 25,000 hospital days per 100 deaths and 25 per cent of the admissions should be incipient or early cases. New Haven's score on these items in 1929 was 29 out of a possible 35 points, the loss in score being on failure in the second factor of incipient cases. That the city is mak-

ing an unusual effort to hospitalize advanced cases is shown by the fact that while the quota of patient days was 23,750 there were actually given 71,709 patient days.—Herbert R. Edwards' story of Tuberculosis in New Haven *Month. Bull.*, New Haven Health Dept., Mar., 1930.

**Refrigerating Systems**—Refrigerants used in New York City include ammonia, carbon dioxide, sulphur dioxide, methyl chloride, ethane, propane, isobutane, ethyl chloride, dichloromethane and dichloro-ethylene. Permits are issued by the Fire Commissioner. Refrigerating systems are divided into three classes according to capacity, Class A including those containing not less than 1,000 lb. of refrigerant, Class B including units using from 20 to 1,000 lb., and Class C including those using less than 20 lb.

The use of sulphur dioxide, methyl chloride, ethyl chloride or hydrocarbon refrigerants is not permitted in class A systems. The use of ethyl chloride or hydrocarbon refrigerants is not permitted in Class B systems in built-up sections of the city. About 80 per cent of Class C systems use sulphur dioxide, the remainder using ammonia, methyl chloride or some of the hydrocarbons. Permit is required for Class A and Class B systems but not for Class C. The use of multiple systems is not permitted in tenement houses.—Shirley W. Wynne, M.D., Dr.P.H., and John Oberwager, M.D., *J. A. M. A.*, 94: 1061 (Apr. 5), 1930.

**Scarlet Fever in Syria**—Measles is 24 times as common as scarlet fever in the Syrian States. Of more than 700 persons tested, of whom approximately half were less than 10 years of age, only 6.5 per cent were Dick positive. It is suggested that the Syrian population has a high resistance to puerperal infection, paralleling its immunity to scarlet

fever. The puerperal morbidity rate was 9.33 per cent in a study of more than 1,000 deliveries in the American Hospital at Beirut, a region of high scarlet fever immunity. The question is raised as to the possibility of this favorable rate being due to a group immunity within the streptococcus group.—Leland W. Parr, Is Immunity to Scarlet Fever a Factor in Puerperal Sepsis?, *J. Prev. Med.*, 4: 105 (Mar.), 1930.

**Hookworm in Alabama**—The determination of the percentage of the total population which is infested with hookworm does not give a complete and full picture of the problem. Examinations may yield a large number of positive specimens, indicating a high infestation rate, and yet the intensity as determined by ova counts may be low. A survey has been made of the State of Alabama by counties indicating not only the incidence of infection in each county but also the intensity.

The results of this study present an excellent testimonial of the value of full-time local health organization. There are at the present time only 4 counties in Alabama with an intensity index exceeding 20. Three of these counties have no local health department, the fourth one having recently established such an organization. In 1923 in Covington County, when the Health Department was organized, the incidence was 85 per cent and the intensity 56. After 5 years of treatment of cases and improvement of sanitation the intensity index has been reduced to 14, a decrease of 75 per cent.—L. C. Havens and R. Castles, The Evaluation of the Hookworm Problem of Alabama by Counties, *J. Prev. Med.*, 4: 109 (Mar.), 1930.

**Philadelphia Hospital and Health Survey**—A health inventory of Philadelphia has been taken. A measuring stick has been employed to evaluate the health services performed by both offi-

cial and non-official agencies. Recommendations have been made concerning the state and city governments in so far as they pertain to public health as have also recommendations for the nonofficial health agencies and the general public of this city.

The Department of Public Health is organized under a director of public health, appointed by the mayor, with a board of health consisting of 3 physicians including the director, who is the president. Apparently the Board of Health does not function in a manner common to most boards in other cities and has only about four meetings each year. The department is divided into two main bureaus, one for hospitals and one for health. The staff of the Health Bureau includes 111 physicians and dentists, 95 nurses, 46 other technical and professional personnel, 222 instructors, clerical and other personnel, amounting to a total of 474 employees. This does not include the medical service for public schools.

Judging by the *Appraisal Form*, Philadelphia receives a weighted score of 73.8. The local office for vital statistics is maintained for the most part by the State of Pennsylvania. Vital statistics is given a score of 71 due to failure to print annual reports and to check the accuracy of reported births and deaths and reconcile with reportable cases. Death certificates are not indexed alphabetically and graphic methods are not used.

Communicable disease control receives the high score of 94. It is recommended that there be provided a full-time epidemiologist to be in charge of the Division of Communicable Diseases. Case reports for typhoid fever and diphtheria are below the average. Venereal disease scores only 58 due to incomplete reporting, lack of search for sources of infection, absence of leadership in the division and inadequate field nursing service. Tuberculosis Control

is scored at 76 as cases are incompletely reported and there is inadequate institutional provision for cases.

Maternal Hygiene is given the high rating of 98, Infant Hygiene 88, Pre-school only 52 and School Hygiene 60.

The milk supply comes from 20,000 farms located in 5 different states. About half of the milk is brought to the city by motor trucks. The cream supply comes from 15 states, as far west as Kansas, Mo., Minnesota, and Iowa. The supervision of this milk supply is left largely in the hands of the Philadelphia Interstate Dairy Council. It is not required that milk delivered in the city come from tuberculin tested cattle. There are 34 pasteurization plants for which the official supervision is inadequate. No samples of milk for bacteriological examination are taken before pasteurization, although Pennsylvania has had a law since 1926 requiring the medical examination twice a year of all persons handling food in public eating places. No provision for carrying out the work has been made. Food and Milk Control score 75.

The water supply comes from the polluted Delaware and Schuylkill Rivers and is filtered. In 1927 it was found that one plant failed to meet the U. S. Treasury Department Standards for 2 months, another plant for 3 months, 3 plants for 7 months and 1 plant for 9 months. There are many cross-connections between the polluted river water and the city supply. It is recommended that steps be taken to reduce the pollution of the waters of the two rivers from which the supply is drawn. Sanitation, including water and sewage disposal, scores only 41.

The laboratories located in splendid new quarters score 75, Popular Health Instruction 82, Cancer Control 56, and Heart Disease 91.

It is recommended that there be a separation of the administration of the Bureau of Health from that of the Bu-

reau of Hospitals. It is recommended likewise that the city be divided into 10 districts with approximately 200,000 population each with the object of decentralizing the field work of the department and that these districts be used as a basis of statistical comparisons with respect to the prevalence of disease.

The Bureau of Hospitals is divided into three main divisions, the Philadelphia General Hospital, The Philadelphia Hospital for Contagious Disease and the Philadelphia Hospital for Mental Diseases. Of the total appropriation of \$5,500,000 of the Department of Health for the year 1929, the Hospital Bureau received \$4,600,000 and the Health Bureau only \$820,000. In 1928 Philadelphia spent \$.52 per capita for health services. It is recommended that this be increased to at least \$1.00.

Philadelphia's first hospital, opened in 1751, cared for 68 patients. Today there are 58 hospitals caring for 200,000 bed patients and serving 500,000 in the outpatient departments. Within the city limits there were 10,732 beds available in 1928. By 1930 it is planned to have 12,198 beds in the Philadelphia area which will provide 5.1 beds per 1,000 persons for the Metropolitan District. Two special incidence surveys were made to determine the utilization of the hospital beds.

In 1928 the Philadelphia hospitals were used to 67 per cent of their rated capacity. On the census days 19 per cent of the patients had their homes outside of the city. It is recommended that at least 1,000 more beds be made available in convalescent homes and 1,500 in homes for chronic cases. Negroes constituted 14 per cent of the patients in the hospitals on the census days in comparison with 7 per cent in the general population.

During 1928 there were 89,851 surgical operations performed in the hospitals, 26,838 of them for removal of tonsils and adenoids.

In 1919, 38 per cent of the cases hospitalized were medical, but by 1928 this had dropped to 26 per cent. In 1928, 51 per cent of the total births in the city occurred in hospitals. —Haven Emerson, Sol Pincus and Anna C. Phillips, *Philadelphia Hospital and Health Survey*, 1929, published by the Philadelphia Hospital and Health Survey Committee, 311 S. Juniper Street, Philadelphia, Pa.

**The Influence of Non-Resident Deaths upon the General Death Rate in Large Cities**—With the assistance of health commissioners in the large cities we were able to prepare a table which reveals to what extent non-resident deaths affected the crude death rate in 1929 in the respective cities. We submit the data for the benefit of officials who love to revel in vital statistics.

The subject is not a new one. For years and years the statistical session of the American Public Health Association has been grappling with the problem of charging these deaths properly. We all know that the non-resident death must be credited to the city or subdivision in which it occurs. This rule was established by the U. S. Bureau of the Census and on the surface it appears to be a good one with the breaks about fifty-fifty; but a glance at the table shows that there is a wide variation in the cities which have been listed in this study.

In New York, Chicago and Detroit the influence of non-resident deaths upon the total number and the crude death rate is slight, and in all likelihood is reconciled by the number of residents of these cities who died in other places. On the other hand, the percentage of non-resident deaths in Boston, Minneapolis and Pittsburgh seems to be unusually large.

Even in the intermediate group we have reason to believe that in some of

the cities the number of non-resident deaths is out of proportion to the number of residents who died elsewhere.

The reasons advanced by health commissioners for the relatively large or small number of non-resident deaths will bear reflection, but for the sake of brevity we shall only express group judgment.

In San Francisco, Buffalo, Cleveland, Washington and Cincinnati the location of hospitals, sanatoriums and institutions within the corporate limits of the cities undoubtedly has a bearing upon the large number of non-resident deaths charged to these cities.

Then again not a few cities, notably Kansas City, Mo., Buffalo, Cincinnati, Washington, D. C., and Pittsburgh, are metropolitan areas, the hospitals of which draw upon neighboring cities and states. Health commissioners believe that this has much to do with the large number of non-resident deaths recorded in their cities. The Government Hospital in Washington and a State Hospital in Minneapolis account for a large number of non-resident deaths.

San Francisco, Boston, Cincinnati and Baltimore are centers of medical teaching and this factor may enter the quotient of non-resident deaths.

Oddly enough in three cities, Minneapolis, Rochester and Milwaukee, a good many resident deaths occur in institutions just outside of the city limits. These tend to neutralize to some degree the non-resident deaths in the respective cities.

Labor importation and a large lake front apparently account for quite a number of non-resident deaths in Cleveland and Buffalo.

Vaughan advances the judgment that the number of hospital beds has much to do with the number of non-resident deaths. Under-hospitalization doubtless keeps out of the city many who would come for hospital treatment. To be

specific: Detroit has available only 5,107 hospital beds, one for each 513 of the population, while in Cincinnati they have 1 bed for every 200 inhabitants. In this respect Cincinnati approximates the accepted standard.

Quoting Bolduan, we agree that

When a non-resident dies of an accident there is no question that this should be properly charged to the city as one of its health hazards. Obviously, the death of a non-resident following surgical interference or medical treatment in hospitals should not be charged up locally. In other instances an individual investigation would often be necessary to determine whether the death should be charged to the city in which it occurs or to the place of residence.

Until we have reciprocal provision by which deaths of non-residents can be allocated to the area in which they have residence or in which the cause of death was contracted, and this will be a gigantic undertaking, we shall have to be contented with the present regulation.—William H. Peters, M.D., Health Commissioner, Cincinnati, O.

#### NON-RESIDENT DEATHS

1929

City	Total No. Deaths	Non- Resident Non- Deaths Resident	
			Per Cent
Boston	11,652	2,269	19.5
Minneapolis	4,958	903	18.2
Pittsburgh	9,664	1,739	17.9
San Francisco	7,968	1,153	14.4
Los Angeles †	2,601	363	13.9
Kansas City, Mo.	5,427	727	13.4
Rochester	3,801	505	13.2
Buffalo	7,668	934	12.1
Cincinnati	7,489	890	11.9
Newark	5,632	630	11.2
Milwaukee	6,107	631	10.3
Cleveland	10,982	1,108	10.0
St. Louis	11,913	1,140	9.0
Detroit *	16,057	939	5.8
Chicago *	39,562	1,548	3.9
New York	77,482	2,239	2.8
Washington	‡		
Philadelphia	‡		

\* 1928.

† 2 months.

‡ Figures not available.

# LABORATORY

C. C. YOUNG, D. P. H.

## MUER'S BACTERIAL COUNTING STAND

FRANK E. HALE, PH. D., F. A. P. H. A.

*Mt. Prospect Laboratory, Department of Water Supply, Gas & Electricity,  
New York, N. Y.*

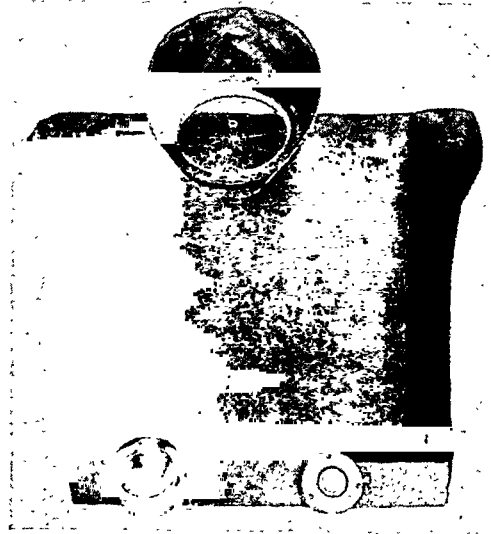
THE counting stand here described has been in use at Mt. Prospect Laboratory for the last ten years. It may be readily made at any laboratory and is here much preferred to the artificially lighted counting arrangements on the market.

The accompanying illustration gives a satisfactory idea of the apparatus. The base is a wooden block  $1\frac{1}{2}$  inches thick, 13 inches long in front, 12 inches long on the rear side and 6 inches deep. To this base is fastened a steel rod  $\frac{1}{4}$  inch in diameter, 15 inches long, and bent at an angle of  $130^\circ$  at a point 5 inches from the upper end. The rod is threaded at the bottom, is inserted in the rear left hand corner of the base and fastened with a nut underneath.

A piece of tin plate or other thin metal, 14 by 24 inches, is bent to fit the wooden block and fastened securely on it. The upper front edge of the metal on each side is rounded and bent slightly outward. A glass petri-dish cover about 4 inches in diameter is ruled by a scratch diamond into twenty equal sectors. This is inverted and fastened with plaster of Paris in an iron ring about  $4\frac{1}{4}$  inches inside diameter, which has a screw clamp attached for fastening to the rod. The entire apparatus, including the plaster of Paris, is now given several coats of a flat black paint. An opaque eye-shade is mounted on the iron ring as shown.

When ready for use, the iron ring with glass dish should be adjusted in

such a manner that no direct light reaches the eyes of the observer but only the black background is in the line of vision, that is, the upper part of the ring should be almost level with the top of the metal back.



The plates are placed in the glass cover and the colonies counted by means of a small hand lens of the usual magnification. For use with daylight a window should be used furnishing well diffused or reflected light and not direct sunlight. For artificial light a 25 watt electric bulb placed 8 inches back of the cabinet at a height of 18 inches gives fairly good results. In no case should the light be arranged so as to strike the eyes of the observer, but it should illuminate the sloping underside of the plate.



## THE DDE — A NEW RESEARCH MICROSCOPE FOR THE SCIENTIST

R. W. ABELL

*Bausch and Lomb Optical Co., Rochester, N. Y.*

A NOTABLE contribution to aid the work of the research scientist is the newly designed DDE Research Microscope, the latest product of the Bausch & Lomb Optical Company, Rochester, N. Y., in laboratory equipment.

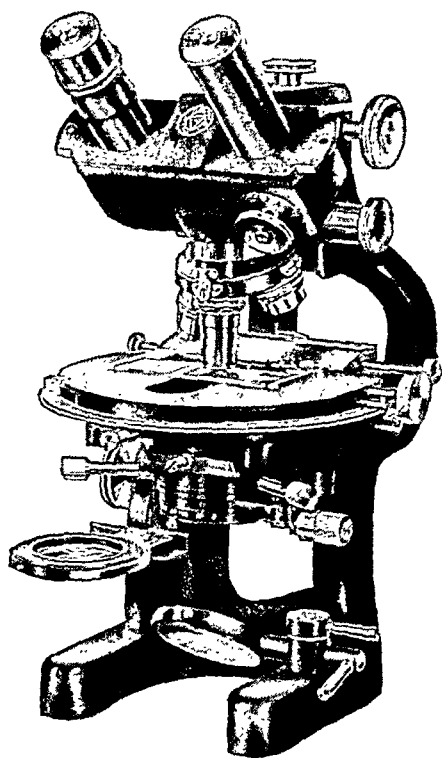


FIGURE I—DDE RESEARCH MICROSCOPE

The DDE marks a radical departure from any former type of research and photomicrographic microscope. The outstanding differences in construction from previous types are instantly noted from the illustration.

Most noticeable of these new ideas in design is the inclined position of the binocular eyepiece which allows the user to sit at the instrument in a natural up-

right and comfortable position. This is an especially commendable feature for continual observation over protracted periods.

The stand of the DDE Microscope also represents an innovation in design, the stage being directly in front of the operator. This "turned about" position offers much greater convenience of manipulation of objects on the stage and of the substage parts.

This new research microscope has been developed by the Bausch & Lomb Engineering Bureau from suggestions first offered by Dr. Lester W. Sharp of Cornell University, with later helpful criticisms submitted by Dr. L. F. Randolph of the U. S. Department of Agriculture and Cornell University.

### DESIGNED FOR PHOTOMICROGRAPHIC WORK

Since the advent of the binocular body, with its necessary prisms and mechanisms, there has been considerable weight placed upon the delicate fine adjustment mechanism. This weight has been too great to secure the responsive action necessary when working at high magnifications. However, the design of the DDE relieves the adjustment of this extra weight. This will be of special value in photomicrographic work where it is necessary to make long exposures.

The instrument may be equipped with either the regular single objective binocular body tube for visual use and also for drawing with the camera lucida, or with the single tube for photomicrographic work.

For photomicrographic work the mi-

croscope is placed in a horizontal position, resting upon three points of support provided on the two arms and base. This leaves each part intact and the stage vertical.

#### UNUSUAL FEATURES IN MECHANICAL STAGE AND SUBSTAGE

The mechanical stage has many points which make for unusual facility in research work. It has forward and back adjustment by rack and pinion and transverse adjustment by multiple screw. These adjustments are operated from the right hand side of the stage and the stage may be completely rotated with the objective in focus without interference. The specimen may be firmly fixed in position—a very desirable feature in photomicrographic work.

The substage is of the usual form, but combines many excellent features for fine focusing of condensers, dark ground illuminators, etc. A novel feature of the substage is a supplementary condenser on a swing arm. The focus of this condenser is so selected that the field of a 16 or 32 mm. objective may be entirely filled with light without moving the substage or any of its elements from the usual position for high power objectives. Both high and low powers will function properly without readjustment of the substage condenser.

#### NEW RESEARCH LAMP DESIGNED

The development of the DDE Microscope made it advisable to design a new type of lamp, one particularly adapted to research microscope work. As a result, the No. 1815 Research Lamp has been produced by B. & L. as a fitting complement to the new DDE Microscope.

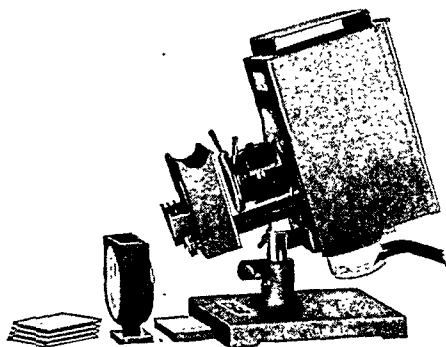


FIGURE II—RESEARCH MICROSCOPE LAMP

This new lamp meets two requirements which few designs satisfy: the one of utilizing the full aperture of the microscope condenser (up to N. A. 1.40) and the other of transmitting sufficient light to make possible critical illumination of the specimen under observation. Adjustments and focusing devices are conveniently placed, and the entire lamp is scientifically correct in every detail.

# VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

**Maternal Mortality in America—**A few preliminary tabulations have been made in regard to the maternal mortality study carried out in 13 states, under the direction of the state departments of health with the coöperation of the U. S. Children's Bureau, from January 1, 1927, to December 31, 1928.

A total of 3,234 maternal deaths was reported in the 13 states. The cause of death for nearly 800 of these was albuminuria or convulsions. Prenatal care has been a big factor in reducing maternal deaths from albuminuria and convulsions, and 373 of the women who died from this cause had no prenatal care; only 20 had the best grade of prenatal care, although 76 had care regarded as good.

Of the total 3,234 deaths, 1,278, or 40 per cent, were due to septicemia; and 570 of the deaths from septicemia were preceded by abortions, 309 of which were self induced. Thus, one-fourth of the women who died from sepsis might have lived if interference had not occurred.—Blanche M. Haines, *U. S. Daily*, Apr. 2, 1930.

**Poliomyelitis in Maryland—**In 1928, out of 287 cases of poliomyelitis reported in Maryland, 126 occurred in Baltimore and 161 in the counties. The epidemic could not be traced to any special focus and could not be regarded as having originated in any one district. Infectiousness of the disease was doubted because of the large number of families in which only 1 case occurred. In 1916 in Baltimore there were 2 cases in the same family in 5 instances; 3 cases in 1 instance; and 7 cases in the same house but in different families in 1 instance. In the 1928 epi-

demic in rural districts there were 2 cases in 3 homes and 3 cases in 1 home.

An analysis of 1,521 cases which have occurred in Maryland showed that 68 per cent were in the age group 0 to 5 years. Of the 287 cases in 1928, 35.54 per cent occurred in age groups 1 to 4 years and 36.24 per cent in the age group 5 to 9 years, while only 3.48 per cent occurred under 1 year. The greatest prevalence of the disease extended over the months from July to November with the peak of the epidemic reached in August when 125 cases were reported, remaining high with 100 cases in September and then showing a gradual decline throughout the remainder of the year.

For 1928, a total of 16 deaths, 13 males and 3 females, occurred in the counties of Maryland, and 11—7 males and 4 females—in the city of Baltimore. Ten deaths occurred in the age group 0—4 years; 7 in the 5 to 9 year group and 4 in the 10 to 14 year group. Of the total deaths 1 was in a child under 1 year of age and 6 were in patients over 15 years of age. The fatality rate for the epidemic of 1928 was 9.0, the lowest rate recorded during the period 1916 to 1928. For the epidemic year 1916, the fatality rate was 31.9, and for the interepidemic year of 1922, the rate was 35.9. The intensive program for early diagnosis, hospitalization, serum treatment and observation of contacts was early inaugurated and was undoubtedly largely responsible for the low fatality rate.

In a study of all cases treated during the 1928 outbreak at Johns Hopkins Hospital, it was found that of 49 patients treated before the onset of paralysis, 92 per cent recovered entirely; of

36 treated shortly after the onset of paralysis, 40 per cent recovered. In a series of 184 untreated cases, all but 14 developed paralysis and 30 per cent recovered. In 54 cases investigated during the 1928 epidemic, the leg was found to be the most frequent single involvement.

The intensive program carried out in Maryland showed that by the use of serum, early hospitalization and the services of an orthopedic surgeon during the whole course of the disease, a low mortality rate, a very low average of total paralysis, a reduction of paralysis of the severe grade and complete prevention of deformities can be expected.—R. H. Riley, *J. A. M. A.*, 94: 550-556 (Feb. 22), 1930.

#### Poliomyelitis in Ottawa, 1929—

There were in all 176 cases reported in the 1929 epidemic of poliomyelitis in Ottawa. The ages of the patients ranged from 7 months to 25 years, averaging 7.43 years, with a maximum incidence between 4 and 5 and between 8 and 9 years. Sixty per cent of all cases reported were males. A noteworthy feature was the comparative rarity of the disease during the first year of life, there being only 3 cases reported.

In all, 181 suspected cases were brought to the hospital for diagnosis or treatment. Fifteen of these cases had lumbar puncture done and received 20 c.c. of serum; they did not have sufficient symptoms to warrant a diagnosis of poliomyelitis and were discharged. Twenty-five other cases that were suspected were later diagnosed as other conditions, 3 cases being pneumonia, 2 pyelitis and 1 each as brain tumor, diphtheria, scarlet fever, acute rheumatic fever, and meningococcus meningitis. All of these received serum at admission when spinal puncture was done. Of the remaining 141 cases that were diagnosed as poliomyelitis, spinal puncture was done in all but 3 cases.

In 18 no cell counts were done but 15 of these were already paralyzed on admission. Convalescent serum was administered to all cases in which paralysis had not been established for more than 2 days. Twenty-five c.c. was the usual dose of serum administered intramuscularly.

Fever was present in 88 per cent of the cases but was rarely over 103°. Headache was the next most common symptom. Rigidity of the neck occurred in 65 per cent of the cases and pain and stiffness of back or limbs in 47 per cent. Tremor and sweating, very common symptoms in other epidemics, were noted in very few cases.

Of the 141 cases treated, 109, or 77.4 per cent, recovered completely and 29, or 20.5 per cent, recovered with paralysis. Of the 31 showing terminal paralysis, 26 already had paralysis on admission, including 2 of the deaths. Of the 115 cases that did not have paralysis on admission, 94.8 per cent recovered completely and 5 recovered with paralysis; one of these cases which developed paralysis had, owing to a temporary shortage of serum, received only 10 c.c. on admission and developed paralysis within 24 hours. One case died without paralysis.—T. A. Lomer and W. T. Shirreff, *Canad. M. A. J.*, 22: 228-234 (Feb.), 1930.

#### Rheumatic Disease in Children—

It was observed that 15 per cent of children over age 3 attending two hospitals in South-East London were treated for rheumatism. A detailed study was made of 250 rheumatic children attending these hospitals. Of these, 180 were out-patients and 70 were watched as out-patients after a prolonged period of treatment in the country. All of the cases were observed for at least 6 months and often for 3 years. Among the 250 cases, 3 girls were affected for every 2 boys and this sex preponderance was more

marked in chorea, the proportion being 1.9 girls to 1 boy. Rheumatism was rarely found before 4 years of age, and chorea a little later, 6 or 7 years. A family history of rheumatism occurred in nearly 60 per cent of the cases but in only about 20 per cent of some non-rheumatic controls. Chorea was found more often where there was a family history of chorea.

In this series, 135 attacks started in the 4 months from November to February, compared with 71 from May to August—a proportion of nearly 2 to 1. Of the 250 cases, there were 41 with related tonsillitis. In 14 cases, rheumatism started at least 5 days after the onset of tonsillitis and in 4 others it started soon after, the interval not being known. Chorea was not observed under age 4 although there were 8 cases of rheumatic pains younger than that.

A systolic murmur was heard during the height of illness in about half of these patients and was much less common in chorea than in other cases of rheumatism. Of 47 cases of persistent mitral murmurs, there were 18 who had signs of mitral stenosis. Two were only 6 years old, 4 were 8 years old, and 8 others were under 14 years. Only 7 had aortic incompetence. Enlargement was found in 37 of the 180 out-patient cases. Permanent signs of heart disease remained in 15 per cent of the out-patients and in 30 per cent of those that had been in-patients.

There was no evidence that tonsils of rheumatic children were more septic than those of non-rheumatic children. Of the 24 children who had tonsillectomy before the onset of the rheumatism, 14 developed chorea and 10 developed rheumatic pains in their first attack, the first manifestation being more commonly chorea than rheumatic pains. This was contrary to what happened in non-tonsillectomized children. Tonsillectomy before there were any

signs of rheumatism (on an average 2 years before) did not prevent its onset or diminish its frequency, nor did it lessen the incidence of rheumatic carditis.—M. Campbell and E. C. Warner, *Lancet*, 1: 61-66 (Jan. 11), 1930.

**Public Health in Iraq**—The latest report on the administration of Iraq, issued by the Colonial Office, shows that 24 hospitals and 78 dispensaries are maintained. The total number of beds in the hospitals is 1,205. The accommodations in Baghdad and Mosul are unsatisfactory. Serious cases are turned away daily. The government has under consideration a scheme for increasing the beds for free patients at the Royal Hospital, Baghdad, from 250 to 500. A new hospital for Mosul of 220 beds has been included in the building program of the government for 1929.

There were no epidemics of general ailments such as malaria or influenza during 1928. Iraq is unfortunate in having so little assistance from voluntary sources in the field of medical work. There is still difficulty in finding Iraqi doctors to fill posts in out-stations. There is also a shortage of other trained medical personnel, such as pharmacists and nurses.

The number of births registered in Baghdad (with a probable population of 250,000) in 1928 was 5,167; in Basra (80,000) 980; and in Mosul (80,000) 2,763. The deaths registered in 1928 were 6,396 in Baghdad; 1,670 in Basra; and 2,686 in Mosul. In the absence of reliable census figures, it is impossible to calculate birth and death rates with any statistical value for these towns. The percentage of deaths under 1 year was in Baghdad 30.7, in Basra 26.3, and in Mosul 39.9. Maternity and child welfare work is being gradually developed in the large towns.—*Lancet*, 228: 386 (Feb. 15), 1930.

# PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

**Basing Sewage Works Requirements on Stream Pollution Studies**—The city of Middletown, N. Y., discharges its sewage, with some tannery and gas works waste, into the Monhagen Brook  $5\frac{1}{2}$  miles above its junction with the Wallkill River. As this river is not used for any public water supply, it is only necessary to insure that no nuisance is caused to riparian owners.

As a result of the refusal of the taxpayers to accept plans drawn up for a sewage disposal plant, an investigation of the self-purification accomplished by the brook and the river was undertaken. As a result of examinations made at stations on the brook and on the river above and below the mouth of the brook, it was clearly established that the self-purification of the brook and the dilution of the river afforded completely satisfactory treatment of the sewage and that at no time was any excessive burden being placed on the river.

It was thought, however, that the formation of sludge banks in the brook might cause troublesome additions to the load during dry hot weather, and plans for a disposal plant consisting of sedimentation tank with separate sludge digestion have been accepted.—A. C. Purdy, *Eng. News-Rec.*, 103: 813, 1929. (From Papers of Water Pollution Research Board, England.)

**The Sewage Treatment Plant of Königsberg, Prussia**—An account is given of the development of Königsberg's sewerage and sewage treatment systems. The growth of the population, the addition of effluents from two sulphite pulp factories and alterations

in the state of the Frischer Haff River were among the causes which necessitated a treatment plant.

The difficulties caused by the difference in the specific gravity between the domestic sewage and the cellulose effluent were met by adding most of the cellulose effluent to the night flow and treating it in the second plant.

The first plant is situated at the end of the first third of the main sewerage canal which is closed to this point. The effluent must leave this plant in a fresh condition but the soil and ground water conditions do not admit of deep tanks, so that the settling tanks are shallow, with channels from which the sludge is pumped daily. A description and plans of this plant are given.

The sewage leaving this plant contains a small quantity of sludge which, after aeration in the sewage canal, assists the deposition of further sludge in the second plant farther down the canal. In connection with this second plant, a description is given of the pumping measures necessary to lower the ground water level and of the building of the concrete settling tanks. The tanks have each two channels from which fresh sludge is removed by two mammoth pumps on a traveling carriage which can be transported from one tank to another. Above the nozzles of the pumps are arranged heavy chains which scrape the sludge from the sides of the channels.

These pumps and the traveling carriages are illustrated and described and an illustrated description is also given of the engine house, which contains two mammoth-dredger plants for removing sludge from the sludge reservoir to the

drying ground, and four double-acting water-cooled compressors for supplying compressed air to pumps and dredgers.

The working costs of the plant as a whole and of its different parts are given.—R. Bruche and G. Sattler, *Gesund. Ing.*, 52: 808 & 827, 1929. (From Papers of Water Pollution Research Board, England.)

**An Activated Sludge Plant with Novel Features**—A description is given of an activated sludge plant installed at Apeldoorn, Holland, for the treatment of slaughterhouse waste by surface aeration. This plant consists of a bar screen, a grease catcher, an aeration tank, a sedimentation chamber, a practically flat-bottomed septic or digestion tank, a grease pit and a sludge pit.

Wooden racks or paddles turn diagonally to the influent and keep solid matter in suspension. Ordinary rotary, street cleaning brushes, which are totally submerged just below the surface and chain driven from a motor driven line shaft, are used for surface aeration. Owing to the air spaces between the bristles a considerable amount of air is beaten into the sewage, an even flow of which is produced by the brushes.

The effluent from the treatment of the waste, whose strength is considerable, is colorless, odorless and quite clear. The reductions in alkalinity and oxygen consumed, which are shown in the results given, indicate the high degree of purification accomplished. The installation of the plant was inexpensive.—*Water & Water Eng.*, 31: 425, 1929. (From Papers of Water Pollution Research Board, England.)

**The Dewatering of Sewage Screenings**—This article is largely given over to a description of the methods employed for dewatering, including pressing and centrifuging, at various plants. There are also data as

to the amount, and character, with analyses, of the screenings produced at a number of cities, covering in all about 25 plants in this country and abroad.

Fine screenings from normal city sewage usually amount to 15 to 25 cu. ft. per million gal. of sewage, weigh 50 to 60 lb. per cu. ft. and contain 75 per cent to 90 per cent water and 80 per cent to 90 per cent volatile matter (dry basis). Pressing is described as it is carried on in Washington, D. C., Boston, Baltimore, Dallas, New York, Milwaukee, Dayton, Miami, Rye, N. Y., Long Beach, Calif., and other places. Centrifuging is described as practiced at Reading, Pa., and Cleveland, O.

Conclusions are that dewatering screenings to an extent when they may be burned without difficulty may be accomplished by pressing and probably by centrifuging. With the increasing number of screening plants, and a growing insistence on hygienic conditions, this method seems likely to develop more in the future.—Kenneth Allen, *Pub. Works*, 60, 11: 414 (Nov.), 1929. Abstr. W. A. Hardenbergh.

**The Significance of B. Coli in Water**—Although a few years ago water was considered safe for domestic use if *B. coli* was absent in 1 c.c., the more recent bacteriological opinion seems to indicate that no water can be considered satisfactory for domestic use unless free from *B. coli* in 50 c.c., or even 100. Since almost no raw surface water is probably consistently free from *B. coli* in at least 10 c.c., this higher standard implies that no surface water is satisfactory without some treatment.

The cities of Glasgow, Manchester, and Dundee, having a total population of over 3,000,000, have been using unfiltered water for more than 50 years, and in the case of Dundee, *B. coli* is seldom absent in 5 c.c. Notwithstanding this, the incidence of disease belonging to the water-borne group during

that period will compare favorably with that for similar diseases in cities using filtered water. As a matter of fact, during the period referred to there has not been a single case of any of these diseases attributable to the water supply. The writer suggests, therefore, that there is too much significance attached to *B. coli* as an indicator of pollution of a pathogenic nature.

The city of Dundee carried out some experiments to show the possibility of *B. coli* pollution from gulls. Results were such that it was not unreasonable to assume that 100 gulls could contaminate a reservoir of 100,000,000 gallons, so that a positive reaction for *B. coli* could be obtained in 40 c.c.

A comparison is made between the standard for water and that laid down by the Scottish Board of Health Milk Order for 1923. In the case of Grade A milk it is required that *B. coli* should not be found in .01 c.c., while in the case of Grade A pasteurized, the limit is 0.1 c.c. When it is considered that milk has a greater scope for and risk of infection from disease producing organisms than water, the writer suggests that it is inconsistent to lay down higher standards for water than for milk, in so far as *B. coli* content is concerned. Further, the inference is drawn that when the water supplies of Glasgow, Manchester, and Dundee are compared with the standards for milk set up, it is impossible to avoid the conclusion that the presence of *B. coli* in 5 or even 1 c.c. does not indicate a condition which is incompatible with safety to health.—George Baxter, *Water & Water Eng.*, 31, 366: 262–264 (June 20), 1929.

**Some Troublesome Weeds Found in Water Supplies**—The author deals with the algae and their behavior as contaminating agents in a water. A general description is given of the appearance of the blue-green algae, the

green algae, including the desmids, and the diatoms.

The algae secrete oily compounds, the chemical nature of which is not completely understood. These compounds, which are produced during the growth of the organism, are analogous to essential oils and are responsible for the characteristic odors of the species. Other odors are produced when the organisms die and decay.

The algae show variations in their seasonal occurrence. Diatoms appear in the spring, give place to green algae and blue-green algae, and reappear in the autumn. The diatoms generally appear after periods of stagnation and during periods of vertical circulation. Algae growths may be controlled by shutting out the light, by chemical treatment with creosote, hypochlorite or copper sulphate, and by combined filtration and aeration which is the most effective method yet advocated.

The influence of environmental, physical and chemical conditions, the algae themselves, their distribution and behavior, and their effect on water supplies all require further investigation.—P. D. Strausbaugh, *W. Va. Univ. Coll. Eng. Bull.*, 1928, Series 14 (*Proc. 4th Ann. Conf. Water Purification*), 102. (From Papers of Water Pollution Research Board, England.)

**A Study of Hookworm Infestation in the Field**—This is a report of experiments on certain aspects of the hookworm problem in relation to the use of night soil as fertilizer. Mixtures of urine and feces, spread on the surface of a field or buried to a depth of 1 foot, permitted development of infective larvae, except in winter, when the eggs died. When night soil was stored in water, the eggs died without any development, within 9 weeks in summer, 5 to 6 in winter. The author concluded, therefore, that living hookworms were present on Japanese manured soil, ex-



cept in winter, and except also in rice fields, etc., which were under water.

As substantiation of such conclusion he studied the nematodes isolated from farm soil with Baermann's apparatus, and found hookworm in the soil, easily distinguished from 43 types of free living nemas. Of 50 yards which had received night soil 2 to 3 weeks earlier, 28 were positive for hookworm larvae. As a final test he himself walked in known infested soil in May and July, becoming infected upon each occasion to the accompaniment of many of the classical symptoms, his egg output per day going from negative to 50,000 and after the second infection to 250,000.

In summary "the author would infer that the principal source of hookworm infection in the Japanese rural districts is the barefooted life on farm field, i.e., skin infection—and that infection in water, such as in rice fields, ponds and others, occurs very rarely."—Y. Minamizaki, *J. Pub. Health Assn. Japan*, 5, 7: 1-3 (July), 1929. Abstr. Norman R. Stoll.

**Sterilization of Dairy Utensils with Humidified Hot Air**—In an effort to determine the value of humidified hot air for sterilizing dairy utensils, its operation was compared with that of two other types of known efficiency, namely, the steam boiler and the steam electric methods. A galvanized iron tank, connected with a steam boiler and fitted with a sump in which immersion type electric heaters or electric air heaters could be placed, was used for all three methods. The time and temperature relationships inside the tank, the power and energy requirements, bactericidal efficiency, moisture remaining on apparatus and utensils after sterilization, and the practicability of operation were measured in a series of tests of each of the three methods.

A temperature of 210° F. was reached in 54 minutes with the humidified hot

air method, using a 9.58 kw. heater; in 51 min. with the steam electric method, using a 16.24 kw. steam electric type heater; and in 76.5 min. with the steam boiler, including the time necessary to generate 80 lb. of steam. There were slight variations in temperature with the humidified hot air, while the sterilizer was heating up. This method was the most economical in cost of energy for operation, and the steam electric method was the most expensive. The humidified hot air method left the utensils practically dry, while an appreciable amount of water was left on them when steam was used. The bacterial reduction was quite satisfactory with the hot air method. In practice this method proved a satisfactory and efficient means of sterilizing dairy utensils. The chief disadvantage of the method is that it furnishes no hot water for washing utensils.—A. W. Farall and W. M. Regan, *Calif. Sta. Bull.*, 468: 13, 1929.—Experiment Station Record, 61, 5: 467-468 (Oct.), 1929.

**The Bottled Mineral Waters. Investigations on Their pH and Their Content of Coli Bacilli and Other Bacteria**—The pH was determined in 21 (apparently French) bottled mineral waters. The values found ranged between 6.0 and 7.6, but different samples of the same brand gave very close checks. Little difference existed between the pH of bottled and fresh mineral water. The number of bacteria per c.c. was between 0 and 10 in 10 cases, between 10 and 100 in 5 cases, between 100 and 1,000 in 3 cases and 400,000 in 1 case. Several waters contained a large number of molds. Only 1 brand contained coli bacilli (200-500 per c.c.).—Jean Bance and Louis Caillon, *Arch. Inst. Pasteur Tunis*, 18: 199-201, 1929.

**Town Penalized for Failure to Chlorinate**—In the spring of 1927,

Kingsville, Ontario, a town of about 2,400 population, suffered an epidemic of typhoid fever, there being about 50 cases, of which 10 or more proved fatal.

A recent court decision awarded \$2,000 damages in a suit against the town brought by a relative of one of the deceased. The text of the decision is given and the conditions leading up to the epidemic are described. Sewage-disposal and water supply had been a problem for many years.

There is no sanitary sewer system and inhabitants have been permitted to connect septic tanks and cesspools with the storm sewers, which ultimately discharge into Lake Erie, the source of the water supply.

Since 1917 the Ontario Department of Health has endeavored to compel the municipal authorities to improve the sanitary conditions and chlorinate the water supply. Pressure filters were

installed in 1921, and in 1926 it was decided to construct a new intake. The old intake, however, failed in February, 1927, before the new one was completed. An opening was made in the settling basin and a trench dug connecting the basin with the lake, the water so obtained being passed through the plant into the distribution system.

A notice was published in a local paper advising boiling of all water used for drinking purposes. The ice disappeared from the lake prior to March 24 and the first case of typhoid developed on April 1. Systematic chlorination was adopted on and after April 14. New intake was completed shortly after and the storm outfall sewer discharge is now being chlorinated.—Anon., *Contract Record and Engineering Review*, 43, 38: 1114–1116 & 1118 (Sept. 18), 1929. Abstr. Rudolph E. Thompson.

# INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

**On the Diagnosis and Treatment of Lead Poisoning**—Some new facts are presented under this title. The diagnosis of lead poisoning rests on a proper evaluation of the following matters: (1) Exposure to lead compounds, (2) susceptibility to lead, (3) symptomatology, (4) physical findings, and (5) laboratory findings specifically related to lead to a greater or lesser degree.

Any type of lead dust, regardless of its solubility or particulate size, is capable of producing lead poisoning if present in sufficient concentration in the air inhaled by animals or man. It has been established, on a fairly sound basis, that the regular inhalation through the usual working day of air containing less than 5 mg. of lead per 10 cu. m. of air does not produce serious lead intoxication in individuals of a representative group (Legge and Goadby). Hence a lower figure than this should be maintained where lead compounds are used. Repeated examinations of the air breathed by workers should be made.

Examination of the feces and urine of representative groups shows the following: (1) 36 children, 71 medical students, and 84 workmen without known exposure to lead nevertheless showed lead in the feces ranging from 0.074 to 0.087 mg. per gm. of ash, and in the urine 0.080 to 0.096 respectively; (2) 114 of the same type of workmen but with a history of previous exposure showed 0.100 in the feces and 0.130 in the urine, respectively; (3) 70 garage workers showed 0.130 and 0.120 respectively; (4) 108 moderately exposed workmen showed 0.192 and 0.181 re-

spectively; and (5) 122 severely exposed workmen showed 0.730 and 0.210 respectively. Thus the degree of exposure may be measured by a study of the excretions.

It is clear that the exposure to lead on the part of most non-industrialized patients is small, but the conditions of life on earth do permit such exposure. That such small absorption produces a regular excretion of lead militates against our ancient concept of an almost quantitative accumulation of lead in the tissues and equally strongly against the notion that lead may exist in an immobile state in the body. It demonstrates also that the toxicity of lead has a quantitative aspect. Lead excretion increases with increased exposure. In the individual case in which the diagnosis is at stake the examination of a single sample of feces or urine or both does not yield adequate information. This is especially true if the exposure has been discontinued for some days or weeks prior to examination.

A table is given showing the excretion of lead in the feces and urine of "J. F." following removal from exposure, when the immediate drop in the amounts present is most significant (explained as that cleared from the bodily passage ways which had been inhaled during the last work day), and the marked effect is noted of administering Epsom salts, calcium lactate, and even work in temporarily increasing lead excretion. As excretion continues, the amount of lead in the body diminishes, and the rate of excretion drops.

Analysis of the blood for lead of 5 persons in whom there was little or no exposure and who showed no symptoms

exhibited a trace of lead in 3 instances. A similar analysis of the blood of 9 persons who had a moderate to heavy exposure to lead but showed no symptoms exhibited lead in measurable amounts in 5 instances, a trace in 3 instances, and none in 1 with only moderate exposure. Thus, it would appear that, even under conditions of severe exposure, measurable quantities of lead in the circulating blood are inconstantly found. A single subject may show lead in his blood at certain times and not at others, while one with a large lead content (in his tissues) is likely to show a higher lead content in his blood.

The usual method of examining blood smears for stippling is somewhat easier than any other method of obtaining information regarding lead exposure and absorption, and its sensitivity for the purpose for which it is used is entirely satisfactory. A table is given showing the close relationship of stippling with the degree of exposure in representative groups of persons. Unfortunately stippling occurs in other afflictions than lead poisoning and even exposure to sunlight involves some changes in the blood cells.

The foregoing evidences of exposure to lead, and those of absorption, may not be used as a means of recognizing the presence or the likelihood of lead intoxication. "All that can be established by the study of lead excretion, lead content of the blood, and histological variations on the blood is the extent of the individual's exposure," but these evidences arm the industrial physician with information needed to limit further exposure of men.

When does lead absorption develop into lead intoxication? What are the earliest evidences of intoxication? In the author's experience there occurs usually first a progressive rise in the number of stipple cells, followed by a drop in the red cell count and in the hemoglobin content. These occur very frequently without any subjective symp-

toms, or any other physical signs. Hence, these progressive changes may be regarded as suggestive of impending intoxication while the diminution of the hemoglobin content is to be regarded as an actual evidence of intoxication, with or without associated subjective symptoms (excepting those instances in which the blood changes are due to other causes).

In regard to susceptibility and without attempting explanations, there are certain influencing conditions of which the most important are: (1) general vascular disease, (2) general hepatic disease, (3) tuberculosis, (4) active chronic infections in general, (5) starvation, and (6) fatigue. In addition, immaturity in both animals and man is an important factor. Hence there must be care in the exclusion from lead occupations of persons in whom any of these factors are at work. "In connection with vascular disease I cannot but state my tentative conclusion that lead intoxication is only doubtfully to be regarded as a cause of vascular disease." It rather appears that arteriosclerosis among lead workers is little higher than in a corresponding age group of the general population, but the occurrence of lead intoxication in persons with arteriosclerosis is high indeed.

That the symptoms of lead poisoning are due to lead in the circulating blood has been stated by many persons, but up to the present there has been no direct evidence that such is the case. In fact, previous attempts to discover lead in the blood have failed because of a lack of adequate methods. The author finds (by the methods which he has used) that in all cases of acute illness studied to the present in connection with lead poisoning, lead is uniformly found in the blood in measurable quantities. "It may well be that a range of concentration may be found constantly associated with the presence of symptoms." At present it may only

be said that finding more than traces of lead in the blood indicates the strong probability of significant recent exposure.

Encephalopathy is the most dangerous form of lead intoxication and the most unsatisfactory to treat. Furthermore lead palsy, while usually not serious as to life, presents a gloomy prognosis as to the return of normal function. "Nervous tissue has a striking ability of fixing such lead as reaches it." (Tables show the retention of lead in the brain of rabbits after long periods of time, even 17 months.) If one has absorbed lead in the brain he may presumably develop encephalopathy at any time afterward. The distribution of lead in the tissues of a typical fatal case in one "J. G." is shown in a table from which "the index of selective absorption" by different tissues showed in descending order (percentages) the following: rib bone 31.71, long bone 19.51, cartilage 11.22, bone marrow 6.75, spleen 2.10, liver 1.73, pancreas 0.88, brain 0.85, kidneys 0.53, heart 0.33, blood 0.32, lung (rt.) 0.26, lung (lt.) 0.13, and nil in fat, spinal fluid, and suprarenal. The case in question died with a terminal lobar pneumonia and, in fact, there is quite commonly a contributing factor in the development of lead encephalopathy, which the author has seen follow a prolonged anesthesia and evidently also influenza. In such the differential diagnosis is a matter of some doubt. Conditions which produce cerebral anoxemia are strongly suggestive factors in developing acute brain symptoms due to lead.

In regard to treatment, early lead intoxication recovers spontaneously, when exposure to lead stops, unless other ailments are present, or there has been a repeated or prolonged injury from exposure over a considerable period of time. Recovery has especially to do with the elimination of lead from the body and the patient left alone will tend

to eliminate from his body the offending agent.

... In time he will excrete all of the lead except that portion which is firmly bound in his tissues. At present, there is no evidence that lead is fixed in any tissue of the body, with the exception of the central nervous system. Therefore there is no need for the use of therapeutic measures which will aid in the elimination of lead from the tissues except in the case of the brain. Here, unfortunately, no such measures are known, though it is likely that experimentation will discover them.

The usual measures for increasing lead elimination during the period of intoxication are dangerous and unnecessary except what may be accomplished by increased use of water. Decrease of the symptoms of lead poisoning is due partly to the large amount absorbed from the blood into the tissues and partly to that eliminated.

Experiments with rabbits show that the normal distribution of lead is (percentages) as follows: bone 6.55, central nervous system 4.13, liver 1.09, skin and hair 0.93, blood 0.82, etc. In one rabbit injected with 12 mg. of lead the total found in the tissues was 5.91 and that in the excretions 5.16, thus accounting for a recovery of 11.07. The speed with which lead is removed from the blood—this being done almost quantitatively when lead is absorbed by way of the alimentary tract—saves the other tissues from the effects of high concentration over long periods of time. It is doubtful if symptoms occur so long as lead is distributed in the normal fashion (above referred to). In regard to the time relations one table shows that the lead is out of the blood after 16 hours and appears to have reached its "normal distribution" after 65 hours.

Two further tables show the effects of treatment, the general principles for which are summarized thus: (1) remove from exposure; (2) put at rest (rest favors distribution of lead in the tissues, while exercise promotes excretion); (3) give a cathartic, as Epsom salts; (4)

give water in large quantities and at the same time (5) "A sufficient amount of calcium, potassium, and sodium salts to maintain a proper salt balance in the tissues"; (6) large quantities of citrus fruit juices; (7) a full mixed diet to maintain normal physiological processes; and (8) strictly avoid agents which are believed or known to promote a quick release of lead from the tissues.

In the case of cerebral involvement, empirical procedures will have to be followed but encouraging results have been obtained from intravenous injections of hypertonic salt solutions. Coexisting chronic diseases must be treated and especial attention given to an infected mouth, chronic infections in general, caution against fatigue, the use of alcohol, and the avoidance of exposure to acute infections, cold, and inclement weather.

With the above attention, the typical case of lead poisoning, without involvement of the central nervous system, will recover uneventfully, and in most instances will show little or no residual effects from his experience.—

Robert A. Kehoe, *J. Med.*, Cincinnati, O., Mar., 1930, pp. 1-11.

**Miners' Nystagmus and Incapacity for Work: A Clinical Study Based on an Analysis of 512 Cases**—These cases, which were examined during the period 1921-1929, were drawn from various sources in the South Wales coal field. Among the conclusions are the following:

1. Defective eyesight does not render an underground worker more likely to develop nystagmus than a man with good sight.

2. Defective vision has no influence on the average period of incapacity nor the period of recovery from the first attack of nystagmus.

3. The average case of miners' nystagmus, if observed over a period of about 9 years of incapacity, may be expected to work underground for about 3 years, and to be totally incapacitated for about 2 years.

4. There is a definite risk of recurrence

of incapacity on the average in 3 to 4 years after resuming work underground.

5. The average period of recovery from the second attack is a little longer than from the first attack.

6. The average age at which disease appeared was much the same in neurasthenic cases as in other cases, viz., 41 years, and the average period spent in underground work before incapacity was about 27 years.

7. Young men are less incapacitated than elderly men, but there is no evidence that elderly men are more prone to a recurrence.

8. There is no evidence that a man with only one eye is likely to develop the disease at an early age.

9. There is some evidence that the average period of recovery from the first attack is a little longer in highly myopic men than in those with normal vision.

10. Illness or injury may determine the onset of miners' nystagmus.

11. Miners' nystagmus is distinctly different than other forms of nystagmus.

12. The oscillations of the eyes may be worse in one eye than the other, and this sometimes has a relation to visual acuity.

13. The wearing of corrective lenses does not influence recovery from the disease.

—J. W. Tudor Thomas, *J. Indust. Hyg.*, XII, 1: 1-23 (Jan.), 1930.

**Proposed Standard Smoke Ordinance**—A joint committee made up of representatives of the American Society of Heating and Ventilating Engineers, the Stoker Manufacturers' Association, the American Civic Association, and the Fuel Division of the American Society of Mechanical Engineers, has prepared a tentative draft of a standard smoke abatement ordinance composed of 11 principal sections and ready for adoption by any city.—U. S. Bureau of Mines, *Information Circular 6262*, Mar., 1930, 6 pp.

**Typewriting and Lead Poisoning**—The author investigated a well known make of typewriter which has been on the market since 1903 and has discovered that the keys make a contact with a lead cushion which prior to that date was composed of felt. He studied the effects of using the typewriter in the

Caisse Regionale d'Assurances et du Service de Sante in Leningrad in a bureau using from 5 to 9 of the machines, and elsewhere. He discovered lead in the air in the vicinity of the machines to the extent of 0.19 mg. per cu. m. of air, an amount which is 3 to 4 times that contained in the air about a linotype machine (0.05 mg.).

Selecting 21 typists at the end of the day, he had them wash their hands in a weak solution of acetic acid and obtained on the average from each one from 0.33 to 0.586 mg. of lead. This quantity considerably exceeds that found upon the hands of the workers in the printing establishment who were operating presses (0.292 mg.). In respect to symptoms he found the typists had gastrointestinal troubles to the extent of 55 per cent, including constipation and abdominal pains, accompanied sometimes with colic. In comparison he found that girls working in a carton box factory had similar complaints only to the extent of 19 per cent.

Blood examinations of the typists showed considerably more of anemia than among the carton box makers, the

hemoglobin ranging as low as 66.7 in the former as against 72.7 in the latter. Furthermore, 77 per cent of the typists had a hemoglobin of 70 or below as against only 22 per cent in the carton box workers. He therefore concludes that their symptoms are closely associated with lead intoxication.

In regard to prophylaxis, the author recommends the replacement of the lead cushions with cork covered with velour.—Lipkovich, *Vestnik Sovrennoi Meditziny*, Moscou, juillet 1929. (Office International D'Hygiene Publique, *Month. Bull.*, XXII, 1: 161-167 (Jan.), 1930.

"The Healthy Worker"—This pocket size bulletin of 48 pages, interestingly illustrated, is prepared in simple, effective language for distribution directly to workmen. Principal factors concerning the care of the body and common abnormal conditions compose the 23 separate articles. A health maxim is boxed in at the end of the various articles.—C. O. Sappington, National Safety Council, 20 North Wacker Drive, Chicago, Ill.

# FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

**Long Time Feeding Experiments with Activated Ergosterol—I—**Reviewing previous work of other investigators, it is pointed out that irradiated ergosterol fed in quantities up to 10,000 times the minimum antirachitic dose is not fatal to rats. Quantities from 50,000 to 100,000 times overdosage are rapidly fatal. In nearly every case the previous works failed to determine the potency of the product they employed and experiments were carried out for short periods covering at the most only a few months of life in the rat. In the studies now reported the experiments were conducted from infancy to old age.

The activated ergosterol used in these experiments was prepared by exposing the solution in arachis oil to the rays of a mercury vapor quartz lamp. It was found that there was no great difference in the toxicity of ergosterol irradiated in the oil, in ether under a reflux, or as crystals in the air, provided the antirachitic potency of the preparations was sustained. It is pointed out that it is meaningless to state, as is often done in the medical literature, that a certain number of milligrams of activated ergosterol were administered. The potency of irradiated ergosterol varies enormously with the conditions under which activation is performed, values from zero to a million times the potency of average cod liver oil being obtainable.

Rats receiving 100 times overdosage of irradiated ergosterol for 10 months showed growth at normal rate. They reproduced normally throughout the second generation. In experiments in which much larger doses were administered it was shown that the effects of overdosage with activated ergosterol be-

come distinct when about 4,000 times the minimum antirachitic dose is administered over an extended period. With 40,000 times the overdosage decidedly toxic effects were produced. After about 2 months the animals began to die, and none of them survived longer than 6 months.

Addition of 3 per cent of calcium carbonate in conjunction with 40,000 times overdosage of activated ergosterol greatly increased the toxic effect of the activated product. On the other hand, a similar addition of disodium phosphate was found to result in no potentiation and may possibly lessen the effect of the drug.

Experiments were further made to study the influence of activated ergosterol in the mother's diet on resistance to rickets in the young. The results showed that no large amount of activated ergosterol is transmitted through the milk, although nursing rats did obtain sufficient ergosterol for partial protection when the mothers were given great overdoses.—Charles E. Bills and Alice M. Wirick, *J. Biol. Chem.*, 86: 117, 1930.

**Feeding of Salmonella Enteritidis to Rats on Diets Varying in Vitamin A Content—**Indications that the variation in the content of vitamin A in the diet of the albino rat may alter the permeability of the intestinal wall allowing passage of bacteria to other organs of the body led to experiments to ascertain whether symptoms of "food poisoning" might follow the feeding of suspensions of living *Salmonella enteritidis* to rats on diets containing only small amounts of vitamin A.



Nineteen rats, 10 of which had been on a diet deficient in vitamin A, and 9 of which had received a diet with adequate amounts of vitamin A, were fed living cultures of *S. enteritidis*. "Food poisoning" symptoms did not follow the swallowing of *S. enteritidis* by the rats on the vitamin-A-deficient diet but with 2 rats on diets containing adequate amounts of vitamin A the swallowing of *S. enteritidis* was followed by violent diarrhea—apparently a localized reaction. Two rats on the vitamin-A-deficient diet died 6 and 20 days respectively after swallowing the cultures of *S. enteritidis*.

All other rats in the experiment were killed and all animals were autopsied. Of the rats on the deficient diet *S. enteritidis* was isolated from the spleen of 8 of the 10 that had been fed a suspension of this organism. It was isolated from the liver of 2 of these rats, from the lungs of 2, from the kidneys of 1, and the heart blood of 1. *S. enteritidis* was also isolated from the duodenum of 5 of the rats, the ileum of 3, the cecum of 1, and the large intestine of 2.

Many of the cultures from various organs from which *S. enteritidis* was not isolated were found to contain types of organisms which might have come originally from the intestinal tract: coli-like bacteria, proteus-like organisms, staphylococci and streptococci.

As for the rats on the complete diets 3 spleens from rats that had been fed *S. enteritidis* yielded pure cultures of that organism. *S. enteritidis* was isolated from the ileum and large intestine of one rat on a complete diet fed cultures of the organism and from the cecum of another rat similarly treated. The bodies of the 2 rats which had had profuse diarrhea were totally free from *S. enteritidis* 25 days after they had shown "food poisoning" symptoms. The organs of the rats on a complete diet which were fed *S. enteritidis* contained no bacteria of types other than

*S. enteritidis*. The bodies of 10 rats, some of which had been fed adequate diet and some deficient diet and none of which had been fed a suspension of *S. enteritidis*, were examined with great care but no organisms of the Salmonella group were isolated.—Elizabeth Verder, *J. Prev. Med.*, 3: 489 (Nov.), 1929.

**Botulism Resulting from Consumption of Canned Onions**—Two cases of botulism occurring in Chicago in January, 1929, were due to the consumption of canned Italian onions served in sandwiches. One case had a fatal termination.

From the victim in the fatal case spinal fluid was collected one hour before death and blood from the heart and a section of the small intestine were taken at autopsy. These specimens were examined for the presence of the toxin and the spores of *Cl. botulinum*. The blood of the deceased contained toxin of B type *Cl. botulinum* but no toxin was demonstrated in the spinal fluid. A culture of B type *Cl. botulinum* was obtained from the section of small intestine.

Two cans of the same brand of this product were obtained from the store where the incriminated can was purchased. One can was a "slight swell" and the other was normal. Toxin and cultures of B type *Cl. botulinum* were obtained from the abnormal can. As small an amount as 0.01 c.c. of the liquor from the "swelled" can was sufficient to cause the death of 300 gm. guinea pigs.

From the opened can which had contained the onions originally responsible for the two cases of botulism a toxic B type culture of *Cl. botulinum* was obtained. An inspection of 400 cans of the same product presumably from the same shipment showed the presence of 5 "swells." These abnormal cans were not sterile, containing anaerobic spore-forming bacteria, none of which, how-

ever, was toxic. Normal cans from the shipment were found to be sterile and non-toxic. The onions in the "swelled" can which were toxic, while differing somewhat in odor and appearance from the normal product, were not sufficiently abnormal to attract attention unless particular care was taken to scrutinize the product closely. The original contamination of the product presumably came from Italian soil where the onions were grown and the processing was not sufficient to kill the spores. The outbreak is unusual in regard to the source of contamination of the food product and it is the first instance in which *Cl. botulinum* has been recorded as growing and forming toxin in canned onions.—Stewart A. Koser and Dorothy O. Reiter, *J. Prev. Med.*, 3: 499 (Nov.), 1929.

**A Study of the Vitamin B Complex of Red Kidney Beans and Polished Rice**—The technic developed in Dr. Sherman's laboratory (Sherman, H. C., and Axtmayer, J. H., *J. Biol. Chem.*, 75: 207) for determining whether vitamin B or G is the limiting factor in studies of the vitamin B complex (Sherman, H. C., and Spohn, A. A., *J. Am. Chem. Soc.*, 45: 2719). Polished rice was found to be deficient in both vitamins B and G. Red kidney beans were found to contain both B and G, but proportionately more of the former.—J. H. Axtmayer, *J. Nutrition*, 2: 353, 1930.

**Studies on the Destruction of Vitamin C in the Boiling of Milk**—This paper presents the results of studies with guinea pigs to determine if boiling

milk in aluminum vessels has any particularly destructive effect on vitamin C. The literature on the vitamin C content of milk as affected by various commercial practices is reviewed.

The commonly used methods of determining vitamin C are critically reviewed and the limitations of the method used by the authors are clearly set forth. The following daily doses of raw milk, milk boiled in an aluminum vessel, and milk boiled in a glass beaker were fed: 20, 25, 32, 40, 50, and 62.5 c.c. The authors conclude:

... Twenty c.c. of raw milk and 25 c.c. of each of the boiled milks are practically on a par and 40 c.c. of the raw milk and 50 c.c. of each of the boiled milks are also about on a par. ... Intermediate groups bring out intermediate effects. These data, therefore, support the conclusion that boiling of milk, as in our experiments, reduced the concentration of the antiscorbutic potency to 80 per cent of its original value, and that there has accordingly been a 20 per cent loss. They also show that there was no detectable difference between boiling in the two types of vessels.

They also interpret their data as showing that

... The quality of the winter milk used and obtained from ensilage-fed cows was better than any heretofore reported upon and almost, if not actually, as potent as the best summer milk obtained from cows on pasturage. This points to a forgotten but possible high potential value of milk as a carrier of vitamin C.

Data are presented to show that

The amount of aluminum contributed to Pittsburgh tap water and fresh milk upon boiling in an aluminum vessel is practically nil, being 0.1 to 0.4 parts per million.—

E. W. Schwartz, F. J. Murphy and R. M. Hann, *J. Nutrition*, 2: 325, 1930.

# PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.\*

**The First Trained Nurse in America Dies**—Linda Richards, 89 years old, "the first trained nurse in America," and a friend of Florence Nightingale, died in Boston, April 16, 1930.

Born in Potsdam, N. Y., July 27, 1841, she spent her girlhood in Vermont. She became the first applicant and first graduate of the first school of nursing in the country, that established by the New England Hospital for Women and Children in September, 1873.

In 1875 she became Superintendent of Nurses in Bellevue Hospital, New York, where she helped to form the training school for nurses and where she remained for 2½ years, leaving there to make a study of European hospitals.

In 1885 she went to Japan where she founded a Mission Training School for Nurses in Kyoto, "then she came home and carried on nursing reformation in hospitals for the insane, going from one to another, and leaving each with an improved nursing system." During her life she directed nursing schools in Philadelphia, Boston, Brooklyn, Kalamazoo, Hartford and Worcester.—*A Short History of Nursing* by Dock and Stewart, Putnam, 1920, pp. 147, 159; *History of Nursing and Sociology*, compiled by a Sister of Charity, Brewer-Colgan Co., 1929, p. 43.

pr.

**S. More about Industrial Nursing**—addressing the Industrial Nurses' Association of Rhode Island, John F.

Kenny, M.D., Pawtucket, gave some timely advice. He urged carefully kept records, for these can be used for reference in accident claims. The records of medical cases particularly should be guarded carefully. They are the private property of the physician and nurse and not open to any employer or department head to read at will.

He warned the nurses not to occupy a position that should be filled by a physician. A nurse should take great care not to treat a case. Under no circumstances should a nurse dispense drugs except on an order from a physician.—*Timely Suggestions, Industrial Nursing Questions, Pub. Health Nurse, XXII, 222 (Apr.), 1930.*

To those who have observed how glibly some industrial nurses hand out drugs to their patients without a physician's order these suggestions of Dr. Kenny's are indeed timely.

One nurse who did distinguished service overseas told with pride about the number of boils and small abscesses she opened. When asked if this did not meet the disapproval of the physicians in the community she said she was always having trouble with them, but she seemed strongly entrenched, as statistics showed that her services had saved her employers a great deal of money. There will be hardship for ethical nurses when other industrial concerns in that community begin to employ them.

Medical ethics in all phases of public health nursing is more difficult than in any other kind of nursing, and many public health nurses have failed either because the ethics of their work was not made clear in their nursing schools or else their judgments were not firm

\* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

enough to resist the temptation to give treatment without medical advice or to answer the questions all patients are apt to ask about the physicians and their comparative abilities.

The successful public health nurses have had to learn the lesson or drop out. A great deal of the trouble comes from taking young, inexperienced nurses with no public health training and putting them in responsible industrial positions, then expecting them to have good ethics and mature judgment when they are usually left to their own resources. It would be interesting to know how many industrial nurses have standing orders written by the plant physician so they may know what they may do when he is not at hand. It ought to be second nature for a nurse not to treat a patient or dispense drugs without a physician's order.

**Public Health Nurses and Committees**—Many public health nurses fail because they do not see the value of a board or a nursing committee or both behind them, or if they do have such a committee, they often do not know what use to make of it or their duties in relation to it. This is the gap which exists sometimes between the nurse's practice work in her public health nursing course and the actual problems she has to face when she gets out by herself to do all the public health nursing work in a community. She does not get the contact with nursing committees that she needs either in the city visiting nurse associations or in the rural teaching centers where there is usually a full-time health department and perhaps no committees to whom she has any direct responsibility.

In checking up on advisory visits to nurses in the field made by the staff of one state department of public health nursing, the greatest number of recommendations given had to do with the organization of committees or volun-

teers, and the use to be made of them. Many nurses who have formerly been employed by visiting nurse associations, tuberculosis associations, or Red Cross chapters are at a loss when they find themselves employed by an official agency, with no one to whom they are responsible or who will assist them but the health official or superintendent of schools. If they are wise they prevail upon the health commissioner or the superintendent to let them appear regularly before the county commissioners, the members of the city board of health, the school board, or the parent teacher associations, to present their work and ask for suggestions. There are ways to get and use committees even in official positions if the nurse knows what she wants and needs.

There will be an interesting Round Table discussion at the Biennial Nurses' Convention at Milwaukee in June on advisory committees for official health agencies which will deal with this very subject.

In the meantime, every public health nurse will get many of her ideas on the use to be made of committees crystallized by reading what the April 1 number of the *Red Cross Courier* says about them. The idea and much of the text was copied from the Division of Child Hygiene of the Minnesota Department of Health.

The "*Why of Committee Meetings?*" is given as follows:

1. To transact the business necessary to effective control and development of the Nursing Service
2. To shape the program of work on the basis of current examination of accomplishments and costs in relation to needs
3. To keep in touch with the nurse's activities and any situations affecting the work as they unfold
4. To learn more and more about the work and the health and social needs and resources of the community in order to cope with situations before they become troublesome problems
5. To inspire and be inspired

How often committee meetings should be held depends upon whether there is one nursing activities committee for the whole territory, in which case it should probably meet monthly, or whether there is a county-wide nursing activities committee with sub-committees in different sections of the county. In this case the central committee could meet quarterly if the sub-committees met monthly.

Every nurse would do well to have the following items under "*How Can Committee Meetings Be Made to Amount to Something?*" printed and hung on the wall over her desk:

1. Have a regular date. Begin on time and close on time.
2. Send notices early. Mention in notice any important business that is to come up. Follow up by phone call.
3. Rotate the meetings around different parts of the territory.
4. Have a luncheon meeting occasionally.
5. Have a well prepared plan worked out in advance by the nursing activities committee chairman and the nurse, the chairman assuming responsibility.
6. Give important problems due consideration, if not too urgent, by assigning them to one or more committee members for study and report at the next meeting.
7. Make report of month's work as thought provoking as possible, by use of graphs, spot-maps and pictures; by concentrating on one problem at a time carefully prepared for presentation; by using case stories to make a point, not just to arouse emotion.
8. Include some broad educational topic for discussion when possible, such as the modern practice of immunization, local morbidity and mortality rates as compared with those in like-sized places, local ordinances for protection of milk and water supply, the needs of the pre-school child, and the like. Outside speakers might be invited to lead these discussions.
9. If a study of local needs and resources is being made according to N. H. 273, call for report on one section of the study at each meeting.

10. Have some committee member keep in touch with current literature and present a résumé of particularly pertinent articles.

11. Give some demonstration of nursing technic from time to time, such as bag technic, the inspection of a school child, a prenatal visit, maternity supplies.

An outline of a regular order of business is given which a nurse and committee can easily follow; and if this is carried out with dispatch the meetings will not drag along interminably.

So, too, every committee and nurse could well study and keep a copy near by of "*A Few Ways in Which Committee and Subcommittee Members Can Help between Meetings*":

1. Handle publicity; e.g., prepare newspaper material, give talks, design and make exhibits.
2. Assist with any surveys under way such as of crippled children, the feeble-minded, pellagra cases, midwives, the blind, the tuberculous.
3. Encourage expectant mothers to consult the doctor and nurse regarding care. Inform nurse of all pregnant women and new-born babies.
4. Make and distribute sterile obstetrical packages and loan closet supplies.
5. Organize classes in home hygiene.
6. Help with conferences, weighing days, clinics, health days, immunization and other campaigns and summer round-up work.
7. Provide transportation for patients to clinics, hospitals, or doctors when necessary.
8. Promote hot lunches, assist in securing scales, first-aid kits, and playground equipment for the schools.
9. Arrange for a good health library as a permanent part of the public library or school library in your community.
10. Help with record keeping, preparation of graphs, diagrams and pin maps, office filing and other office work.—

The How and Why of Committee Meetings, Public Health Nursing Service, *Red Cross Courier*, IX, 7: 26, 27 (Apr.), 1930.

# EDUCATION AND PUBLICITY

EVART G. ROUTZAHN\*

## SCHOOLS AND CHILDREN

State-Wide Trends in School Hygiene and Physical Education (as indicated by laws, regulations and courses of study), by J. F. Rogers. Office of Education, Department of the Interior, Washington, D. C. 12 pp. *Free*. Includes health education, etc.

For Better Health Education in Our Schools, by Iago Galdston. Reprint from *Journal of Educational Sociology*. March, 1930. 7 pp. New York Tuberculosis and Health Association, 244 Madison Ave., New York, N. Y. *Free*.

Rest and Sleep, by N. L. Reynolds. National Tuberculosis Association, 370 7th Ave., New York, N. Y. 16 pp. For high school teachers. 5 cents.

The Oregon Tuberculosis Association, Fitzpatrick Block, Portland, Ore., issues a monthly School Health Calendar.

The Philadelphia Health Council and Tuberculosis Committee reports dramatized health talks given in 247 classrooms by Mrs. G. G. Levering, who has appeared as "Martje, Our Health Cousin," or "Sylvia, the Health Gypsy."

Gladys Morse of the Michigan Tuberculosis Association visits the schools garbed in buckskin, and tells children fascinating Indian legends with health "morals." Miss Morse recently became "Kee-she-goo-quā" (Princess of the Sky) through adoption by the Chippewas.

A list of 167 Ohio high schools offering programs of health and physical education worthy of recognition by colleges and universities as one of the 16

units of entrance credit has been issued by Dr. D. Oberteuffer, supervisor of health and physical education, State Department of Education.

A Health Project, by Doris Powell. *Public Health*, Michigan Department of Health. Feb., 1930. After a puppet show by the Michigan Tuberculosis Association the 3d and 4th grades worked out a show of their own.

... a cardboard box for the theatre, a roll of white paper for the screen, and to paste silhouette figures in black on the screen to illustrate our story. Two small poles were inserted, one on each side of the theatre, and upon one the "film" was to be rolled. As the picture progressed the film was to be wound off on to the other pole.

The Story of Frankie Fuss is given, and how the project extended into arithmetic, drawing, language, etc. *Free*.

## GIRLS

The cover page has the atmosphere of a department store or specialty shop, this booklet entitled "Better Health for Young Women," issued by the Department of Health, Winston-Salem, N. C. 8 pp. Line cuts. Credit to Syracuse Department of Health for "the cuts and for much of the material." Headings: "The Modern Girl's Health," "New Styles in Health," "Flappers," "It's Smart to Be Healthy," "How to Be Beautiful," "Health for Sale!" A self-scoring chart scores some readable points. With the full credit statement on the back page it might have been better without the Syracuse credit lines under authors' names. *Free*.

What a Whale of a difference a little Health makes in the Everyday Life of

\* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

a Girl. Cleveland Health Council, 715 Superior Ave., N.E., Cleveland, O. For 'teen-age girls. 4-page folder. Inside: "Want to Be Popular?" The recipe includes Pep, Poise, Personality. Their ingredients given. *Free*.

#### DIPHTHERIA

New York State chronology for January 17–February 19, 1930: Monthly meeting of State Diphtheria Conference Committee discussed case and death rates of cities already selected for intensive campaigns, showing need for special effort in some communities; State Federation of Women's Clubs and State Congress of Parents and Teachers have asked local groups to help the campaign; State Committee is preparing outlines of local campaigns for large and small places to send in response to inquiries; special window exhibits were prepared; revised and re-ordered its educational materials and adapted some New York City items for use in other cities, making a total of 14 items.

Diphtheria and Its Eradication, by William H. Park. Westchester Tuberculosis and Public Health Association, 8 Church St., White Plains, N. Y. 8 pp. 5 cents. Address to a parent-teacher association.

Copies of practically all of the following items will be supplied upon request:

Radio: Prevent Diphtheria, by New York City Health Department; Diphtheria in the Discard, by Connecticut State Department of Health; Diphtheria Prevention, by Philadelphia Department of Health.

State department bulletins: New Jersey (Mar., 1930)—Who Gets Diphtheria Now-a-Days? with diagrams; North Carolina (Feb., 1930)—Project about Diphtheria at the North Carolina College for Women—includes text of letters written by college students to home-town children—examples of some effective copy to be sent into the home.

City department bulletins: Milwaukee (Feb., 1930)—Diphtheria Caused Twenty-five Deaths in 1929—Why?; Albany described the local campaign; Middletown, N. Y., reports the "first case of diphtheria since August, 1925, in which the infection could not clearly be shown to have been contracted outside the city." Due to impression of family that a several years' old Schick-test was T. A. T.

#### ART

Child Health Day in Iowa. State Department of Health, Des Moines, Ia. 20 pp. Contains 14 examples of the use of silhouettes. *Free*.

Effective silhouettes illustrate Shopping for the Family Physician. *Hygeia*. Mar., 1930.

Gay line sketches illustrate "How about a Courtesy Campaign?" *Safety Education*, 1 Park Ave., New York, N. Y. Apr., 1930. *Out of print*.

The Infant Welfare Society of Chicago report for 1929 contains a group of 5 photographs, one to a page, and each with a descriptive caption of 4 to 7 lines.

"Improving Picture Production," by W. E. Barr, of the Eastman Kodak Company, in *Editor and Publisher* (Feb. 15, 1930), emphasizes that pictures intended for newspaper reproduction should be clear, sharp and contrasty, and that the print should be made on a "hard" paper.

The *New York Times* manual of Typographical Standards says:

The secret of good newspaper reproduction of illustrations is contrast. Clear, sharp, contrasty photographs will produce good cuts. Flat photographs—prints that have no strong separation of tones—will produce poor cuts.

#### FILM SLIDES

A new film strip consisting of 18 pictures illustrating hazards in the modern American home and 9 explanatory slides has been completed by the National

Safety Council, 20 N. Wacker Drive, Chicago, Ill. The mimeographed lecture on important phases of home safety will be loaned free and a projector rented for \$1.00 a day. For members.

The tuberculosis motion picture, "Consequences," has been made into a film slide strip by the Spencer Lens Company, Buffalo, N. Y.

#### MAGAZINE ARTICLES

The Dentifrice Racket, by Catherine Hackett. *New Republic*. Jan. 15, 1930. Good reading.

Eyes Right, by Fassett Edwards. *Colliers*. Mar. 1, 1930. Danger signs; what not to do.

How to Keep Sane by Maintaining the Health of the Emotions, by G. F. Alsop, M.D. *Woman's Journal*. Mar., 1930.

Infantile Paralysis—How Dangerous Is It?, by George Draper. *Harpers*. Feb., 1930.

This Question of Birth Control, by D. D. Bromley. *Harpers*. Dec., 1929.

This Will Be Smallpox Year. *Literary Digest*. Mar. 15, 1930. From *Ohio Health News*.

#### SAFETY

Home Accidents and Home Economics, by S. J. Williams. *Journal of Home Economics*. Mar., 1930.

"Every 17 minutes another traffic death," is illustrated by the National Safety Council by shading 17 minutes on a clock face.

A page advertisement, paid for by 32 firms, headed "A Message to Parents—The Street is a Poor Playground," was one of a series supported by merchants in coöperation with the Toledo Safety Council.

*The News Letter*, National Society for the Prevention of Blindness, 370 7th Ave., New York, N. Y. (Feb., 1930. *Free*), states that a 70 per cent cut in eye injuries resulted from the following:

A large blackboard, 4 feet by 8 feet, was placed at each of the three entrances to the factory of the Autocar Company. Twice each week safety messages were inscribed on these boards in three brilliant colors of chalk and in a striking design. Here are three typical messages:

"You don't want to peddle lead pencils on the street.—Goggles Prevent Blindness."

The design used was a large drawing of a pair of goggles. A second message read as follows:

"The most delicate organ in your body. One flying chip may blot out your sight.—Wear Goggles."

A drawing of an eye was used for the design. Another message read as follows:

"Don't try to be your own eye doctor. Dangerous infection is caused by removing particles with a toothpick, finger or handkerchief.—Refer all eye troubles to the nurse, and do it at once."

#### POSTERS

Two posters to encourage the care of children's teeth have been issued by the Bureau of Dental Health Education, American Dental Association, 58 E. Washington St., Chicago, Ill. *Write for details*.

A new poster by C. Le Roy Baldridge has been issued for nursing services by the National Organization for Public Health Nursing, 370 7th Ave., New York, N. Y.

One copy of a new poster accompanies every issue of *Safety Education*, National Safety Council, Park Ave., New York, N. Y. *Sample free*.

A series of 12 bulletin board posters on automobile safety has been started by Employers Mutual Indemnity Corporation, Wausau, Wis. *Free*.

An original poster for display on bulletin boards in the plants of the Western Electric Company is issued every month by R. T. Barker, director of health and safety, 195 Broadway, New York, N. Y.

#### NEW NAMES

*National Health*, 5, Favistock Square, London, W. C. 1, England. Now *Mother and Child*, having become the



official organ of the National Council for Maternity and Child Welfare.

*The Poster Magazine* is now *Advertising Outdoors*, 165 W. Wacker Drive, Chicago, Ill. *Sample copy upon request.*

#### PSITTACOSIS

Psittacosis (pronounced sit-ak-o'-sis)—“A disease of parrots communicable to man, marked by high fever and pulmonary disorders.”—Middletown, N. Y., Board of Health *Bulletin*.

“One of the greatest dangers of any possible epidemic disease lies in the hysteria that develops in connection therewith. Fear plays its part in increasing morbidity even while the infection is definitely declining.”—*American Medicine*, New York, N. Y. Feb., 1930. Another opportunity for careful publicity.

“Poor Psittacosized Polly”—*Literary Digest*, Feb. 8, 1930.

A cartoon, “The Timid Soul,” by H. T. Webster. In *New York World* and other dailies. Feb. 3, 1930.

#### READING LISTS

Bibliography on the Relation of Clothing to Health, by O'Brien, Peter-

son and Worner. Superintendent of Documents, Washington, D. C. 25 cents.

The Parents' Bookshelf. American Library Association, 520 N. Michigan Ave., Chicago, Ill. Health, sex, nerves, etc. 10 cents.

#### REGRETTABLE—UNNECESSARY

A city department of health issues its monthly bulletin and its annual report on a shiny, white paper not pleasant or easy to read.

Public Education in Mental Hygiene—says *Mental Hygiene Bulletin*:

The widespread development of interest in mental hygiene in recent years has greatly stimulated educational activities in this field, and leaders in psychiatry and mental hygiene concerned with the guidance of these activities on a sound basis have agreed that the time has come for an evaluation of the methods and material employed in this work in various parts of the country.

... Determination of standard lines along which the methods and contents of lay education in mental hygiene should be developed in the future, and the formulation of a plan for recruiting writers and speakers trained in the art of simplifying technical material for the benefit of non-professional groups, are among the results it is hoped will come from the study.

## BOOKS AND REPORTS

**The Psychology of Learning Applied to Health Education through Biology**—By Anita Duncan Laton, Ph.D. New York: Bureau of Publications, Teachers College, Columbia University, 1930. 103 pp. Price, \$1.50.

This is a report on an experiment made in the Lincoln School of Teachers College, Columbia University, to test the validity of certain methods of teaching. The study is described as an attempt to apply the facts and principles established by work in the psychology of learning to the teaching of one unit of subject matter to junior high school biology.

The unit on prevention and control of communicable diseases was chosen for experimentation because its contribution to health education seems obvious and important. The chosen objectives were education for health (useful to the student now and later in life) and satisfaction of commonly accepted standards regarding subject matter for a course in biology. The diseases chosen were those having the greatest value for study by 9th grade pupils in New York City, because of their incidence in this region. Two sections of the 9th grade were chosen for the experiment, one being taught in accordance with the principles of educational psychology, and called the experimental group, and another section called the control group. Elaborate comparisons of ability, interest and achievement were made in order that the conclusions drawn might be well based. The two sections were found sufficiently similar, both in information and interest.

Discussion is said to have been more animated in the experimental class. There were conferences between the teacher and those students who were to give reports to the class, and erroneous statements were corrected before the class. Interestingly, the experimental class laid emphasis in its reports on means of prevention and control of disease, while in the control class there was more emphasis on symptoms and treatment. Since these students are school children, not nursing or medical students, knowledge of prevention seems much the more important. The experimental group chose the diseases most valuable for such studies and showed greater ability to recognize measures for preventing outbreaks of these diseases.

The author is well satisfied with the application of the method. The experiment is well presented and worth reading by teachers of biology, and by others who promote health education and wish to make their presentations of such topics forcible and well retained.

SAMUEL W. HAMILTON

**Physiology and Health**—By C. E. Turner. Boston: Heath, 1929. 282 pp. Price, \$1.00.

This excellent little book, one of the Malden Health Series, is intended for pupils in the late junior high, or early senior high school.

The arrangement and treatment of the subject matter, though conventional, nevertheless shows an understanding, and appreciation of the mental capacity, and the interests of the age groups for which it is intended. Each

## AMERICAN JOURNAL OF PUBLIC HEALTH

chapter is introduced by questions which arouse the curiosity and interest of the reader, while at the end of the chapters are test questions and suggestions for simple experiments. The illustrations are exceptionally good and instructive.

C. M. HILLIARD

**How Great Cities Are Fed—By W. P. Hedden.** Boston: Heath, 1929. 302 pp. Price, \$2.80.

The city dweller who desires a well balanced diet can secure it only if modern commerce makes possible the effective distribution of perishable food-stuffs. A tremendous quantity of such commodities is now transported daily into every large city. How it is done, the facilities needed, the elements of marketing costs, and future developments in this field, are ably discussed in this contribution to the Agricultural Commerce and Administration Series, edited by E. G. Nourse. The book is well printed and illustrated, and should be valuable to all those concerned with agricultural economics.

JAMES A. TOBEY

**The Physiology of Oral Hygiene and Recent Research—With Special Reference to Accessory Food Factors and the Incidence of Dental Caries—By J. Sim Wallace, D.Sc., M.D., L.D.S. (2d ed.)** London: Baillière, Tindall and Cox, 1929. 228 pp. Price, \$3.50.

The author is one of the most active as well as one of the best known students of oral hygiene in England. He is not considered orthodox in regard to the effect of deficiency in certain vitamins on their formation of the teeth, though one cannot read his evidence without feeling that he has given careful study to the matter, and has strong grounds for his opinions. He pays his respects to the Medical Research Council (English) in no uncertain terms, and believes that it has been responsible for

the pushing of certain supposed vitamin containing preparations at the expense of fresh air, good food, cleanliness, sunlight and exercise, holding that as far as dental hygiene goes, its methods have "demoralized research, obstructed progress and commercialized science."

He believes that caries is brought about chiefly by carbohydrate foods, interference with the natural instinct of infants to gnaw, and depriving children of foods which make them exercise their teeth and jaws. He mentions particularly the "lodgeability, fermentability, viscosity, and impermeability of foods with regard to acids and alkalies," and in view of the findings on examination of many school children endorses the quotation "the better the school the worse the teeth," believing that dental caries is a "luxury disease" rather than a "deficiency disease."

The book is well printed and illustrated.

M. P. RAVENEL

**Insects, Ticks, Mites and Venomous Animals of Medical and Veterinary Importance. Part I—Medical—By Walter Scott Patton, M.B., Ch.B. (Edin.), F.E.S., and Alwen M. Evans, D.Sc.** Croydon: H. R. Grubb, Ltd., 1929. 785 pp. Price, \$5.50.

The authors have presented in text form the subject matter covered in a course of lectures and laboratory exercises required of students in tropical medicine in the University of Liverpool. The book is a veritable storehouse of knowledge for the layman, the practitioner, and the student of medical entomology. The subject matter is well selected and fully treated, but for the lay reader a table of contents or an index to the different phases of the material presented would make it much more valuable.

All the important groups of arthropods which are vectors of human disease and those which are harmful to

man in other ways are discussed. Special attention is given to the insect carriers of disease.

The illustrations, which include photographs and drawings of unusual quality, are abundant and good, the printing is excellent and very free from errors. To the practitioner the discussions on diagnosis and the nature and cure of the various diseases are especially commendable.

This volume is dedicated to twelve men who have lost their lives while investigating the etiology of diseases transmitted by insects and acari.

L. HASEMAN

**The Healthy Mind. Mental Hygiene for Adults—***By Joseph Jastrow, Douglas Thom, James Walsh, Thomas Verner Moore, Karl Bowman, Abraham Myerson, V. V. Anderson, and Esther Loring Richards. Edited by Henry Elkind. New York: Greenberg, 1929. 269 pp. Price, \$3.50.*

Expert in psychiatry, and with an unusual flair for its popular presentation, seven eminent physicians and one psychologist presented a series of lectures on keeping mentally fit before a Boston audience during 1929. The result, as is inevitable nowadays, was a book. Like all such results, the book is uneven in style, unsystematic in arrangement, and inconsistent in statement, though never crudely or excessively so.

Even if it does exhibit these defects, the book is also interesting, informative, and indubitably of value. Much of the range of mental hygiene is ably and acceptably presented. Dr. Thom contributes the opening essay, which soon becomes interesting and practical in telling how the mental hygiene of childhood affects adult behavior. Dr. Walsh wanders and rambles, though always entertainingly, with an ardent plea for more leisure in American life; while later in the book Dr. Anderson puts in

a good word for more and better work. Dr. Bowman has a practical and simple essay on fatigue, worry, and depression; but Dr. Moore's dissertation on emotion and intellect is occasionally far from simple, though sufficiently practical. Even a Boston audience might stumble over "the positive normal values of the affective states in cognitive experience."

"Nerves" are acceptably dealt with in this interesting symposium by Dr. Richards, the only representative of her sex among the authors. She boldly points out some of the many flaws in medical practice with respect to psychiatric attention to patients. Perhaps the most notable of the essays is that by Dr. Myerson on normal and abnormal fear, even though he decries the extravagance of popular health propaganda. Finally, Dr. Jastrow contributes an admirable summary.

This book is a valuable contribution to one of the most important of modern health problems. Sanitarians can read it and recommend it with profit.

JAMES A. TOBEY

**National Conference of Social Work at San Francisco, June, 1929—***Editorial Committee: Bleecker Marquette, Chairman, Porter R. Lee, Jane M. Hoey, Joanna C. Colcord, Howard R. Knight, Editor, Bertha Freeman Hooper, Asst. Editor. University of Chicago Press, 1930. 682 pp. Price, \$3.00.*

It is stated in the foreword that considerations of space, general adaptability, permanent value and previous information printed on the subject have led to the omission or abridgment of certain of the papers. It is distinctly pointed out that the fact that a paper is omitted is not to be interpreted as a reflection upon its value.

Among the papers particularly relating to health is an interesting presentation of "The Progress of Occupational Disease Compensation in California,"

by Will F. French, Director of the California Department of Industrial Relations. On the experience of California, Mr. French presents a strong argument for having workmen's compensation laws cover all occupational diseases. Students of the subject will find this paper valuable.

"Gonorrhea and Syphilis—the Biggest Single Problem in Health, Welfare and Community Programs," is presented by Dr. Thomas Parran, Assistant Surgeon General, U. S. Public Health Service, who discussed the extent of the problem, and by Dr. William F. Snow, who presented the solution to the problem. Both of these well organized papers are contributions to the literature on this subject.

"The Economic Aspect of Medical Care" is discussed by Dr. W. P. Shepard, Assistant Secretary, Welfare Division, Metropolitan Life Insurance Company, San Francisco. This paper shows a splendid grasp of the problem of the high cost of medical care. The importance of paid staffs for clinics and hospitals, the desirability of more comprehensive training for both medical students and social workers, the necessity of conferences between the executives of medical and relief agencies in order that they may better understand each other's work, are well emphasized. As an illustration of this type of coördination the work of the Berkeley Coördinating Council is described. Limitation of intake and the adoption of the appointment system by clinics, the reviewer considers to be indispensable. "The Cost of Public Health and Medical Care" is presented by Bleeker Marquette, Executive Secretary of the Public Health Federation, Cincinnati.

In "The Tuberculous Migrant, A Family Problem," Miss Jessamine Whitney, statistician, National Tuberculosis Association, sets forth an excellent body of fact material on the magnitude of this problem which she states is particularly acute in the Southwest.

A scintillating and instructive paper is given by Virginia R. Wing, Director of Health Education of the Cleveland Health Council, in which she discusses a number of psychological experiments in health publicity. The material is new, interesting and well arranged.

The four papers on mental hygiene are all constructive and merit careful reading. BLEECKER MARQUETTE

**Control of Endemic Diseases in the Netherlands Indies**—*Edited by the Netherlands Indies Medical and Sanitary Service. Landsdrukkerij, 1929. Weltevreden. 77 pp.*

Here we have an extremely interesting report by the Medical and Sanitary Service of the Netherlands Indies. The two longest chapters in the report are devoted to malaria and plague. The anopheles which is dreaded in that part of the world is the *A. ludlowi*.

The report is well written in excellent English, and is abundantly illustrated with pictures of before and after; i.e., before the drainage of fish ponds and the introduction of sanitary methods, and after. It constitutes a preachment of the utmost value demonstrating man's control over tropical diseases. The whole report is full of meat.

M. P. RAVENEL

**The Alien in Our Midst**—*Edited by Madison Grant and Charles Stewart Davison. New York: Galton Publishing Co., 1930. 238 pp. Price, \$3.00.*

This is a collection of brief essays and excerpts from the writings of various more or less noted persons who have said their say on one side of the immigration question. The book is a tract in support of restriction of immigration and as such is an able partisan presentation. It deals with sociological, economic, and eugenic problems rather than with public health.

JAMES A. TOBEY

**The Epidemiology and Control of Malaria in Palestine**—By Israel J. Kligler, *Hebrew University, Jerusalem*. Chicago: University of Chicago Press, 1930. 240 pp. Price, \$5.00.

This book gives a description of the work carried out under the Hadassah Medical Organization which was fostered and supported by Justice Louis D. Brandeis and Bernard Flexner.

It is extremely interesting, and in many ways the fate of the Jews who settled in the areas described is a repetition of what took place in Ancient Greece and Italy. Malaria has practically wiped out of existence a number of the settlements.

The chief points in the campaign were: (1) detection and treatment of carriers, (2) antimosquito campaign, and (3) education. Important observations on the action of quinine on the malarial parasite are recorded. The author considers quinine prophylaxis as unsuccessful, many cases appearing even among those who were thoroughly quinized, many others developing from 2 to 3 weeks after its suspension. In other cases it maintained a latent infection. He considers the prophylactic administration of quinine as really a method of abortive treatment.

The book is well illustrated and contains numerous charts and tables which form the basis of the author's conclusions. It is beautifully printed, and is a valuable contribution to the study of malaria in the world.

M. P. RAVENEL

**Laboratory Testing of Germicides and Chemo-Therapeutic Agents**—By Otto Schöbl. (*Published in reprint form.*) *Philippine J. Science*, 40, 2: 283 (Oct.), 1929.

*Testing of Germicides.* A critical review of the value of laboratory tests of germicides as related to clinical value is given. In this connection, the results obtained by Reddish and Drake on the

value of mercurochrome and tincture of iodine for preoperative skin disinfection are criticised because only one test organism, *Staphylococcus aureus*, was used. Similar work by Simmons is commended because he used six test organisms, only two of which, however, are of any practical significance from the standpoint of preoperative skin disinfection. The author overlooks the fact that by using only *Staphylococcus aureus*, the most common cause of post-operative infection and the most resistant of the pyogenic organisms, Reddish and Drake were able to repeat their work more often and with greater accuracy, for which reason their results are just as valuable, if not more so, than those published by Simmons.

G. F. REDDISH

**Lehrbuch der Protozoenkunde, eine Darstellung der Naturgeschichte der Protozoen mit besonderer Berücksichtigung der parasitischen und pathogenen Formen**—Begründet von Franz Doflein, neubearbeitet von Eduard Reichenow (ed. 5). Jena, Verlag von Gustav Fischer. 1262 pp. 1201 figs. 1927–1929. Price, 64 marks unbound, 70 marks bound.

Clinical technicians, bacteriologists, pathologists, and protozoologists alike will welcome this long delayed 5th edition of Doflein's textbook of Protozoology. Its great value lies in its comprehensiveness and its wealth of splendid illustrations. The specialist who is concerned merely with the Protozoa as related to disease needs this broader background to see this wonderfully diversified and widely adapted group of animals in their true places in nature. This new edition is very largely rewritten, due to recent additions to the field. The reviser, Professor Reichenow, in the Hamburg Institute for Tropical Diseases, has somewhat expanded the proportion of

space devoted to the parasitic species and genera of Protozoa. For the first time in this edition, the spirochetes are omitted, since opinion among protozoologists is all but unanimous that they do not belong in the Protozoa.

The accounts of amebic dysentery, the malarias, leishmaniasis, parasitic flagellates, and of the Sporozoa are well illustrated and represent current German opinion in these active fields of research. No clinical laboratory should be without this encyclopedic work of reference.

CHARLES A. KOFOID

**Lead Poisoning**—*Report of the Committee on Lead Poisoning, presented to the Industrial Hygiene Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minnesota, October 4, 1929. New York: American Public Health Association, 1930. 37 pp. Price, \$75.*

The material in this report is intended to be used either directly or indirectly by the general practitioner, the industrial physician, the safety engineer, and Workmen's Compensation Commissions.

Most of the material is segregated into three parts, which provide standards for diagnosis, individual treatment, and industrial control. A short bibliographic note, summarizing the types and describing the kinds of material used, is also included.

Under Standards of Diagnosis are included definitions of the various terms used, with a discussion of these definitions. The symptomatology of acute lead poisoning and of chronic lead poisoning is described.

Treatment is suggested for immediate toxic manifestations, and also that which is directed for the removal of lead accumulated in the tissues.

Under the heading of Standards of Industrial Control, specific suggestions

are given for the hygiene of work-places, for personal hygiene, and for medical supervision.

The committee "has endeavored to emphasize those general principles which seem best to have met the test of practical experience."

This report is a valuable contribution to our knowledge of lead poisoning, and should be in the hands of all physicians, safety engineers, and workmen's compensation officials. C. O. SAPPINGTON

**Diagnostica e Tecnica di Laboratorio. Rivista Mensile—Vol. I, No. I. Naples: Piazza S. Domenico Maggiore. Price (Foreign), 150 Lira.**

A monthly review of the scientific literature of the world in the Italian language has been launched under the guidance of Luigi d'Amato and E. Luigi Zoja with the assistance of a considerable number of scientists among whom one finds Hawk, Mathews, Kahn, Kilduffe and Wells representing this country. Other well known sponsors include MacLeod, Lattes, Castellani, Levaditi, Meinike, Ascoli and Izar. The work seems to be another *Biological Abstracts* although more strictly limited to medical biology. It covers pathology, bacteriology and hygiene, physiology and physiological chemistry, clinical medicine, pediatrics and allied sciences in so far as the laboratory side of these sciences is concerned.

The initial number contains a statement of purposes, an invitation to foreign readers to collaborate in abstracting, several original contributions, editorials, notes and news, and 52 pages of abstracts. Whether such a journal is needed at this time remains to be demonstrated. The difficulties imposed by the language and the fact that in this country abstract journals rather thoroughly cover the field causes one to suspect that it will have only limited circulation.

N. W. LARKUM

# HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Washington, D. C.—The annual report of the health officer for the fiscal year ended June 30, 1929, is primarily noteworthy for the valuable statistical tables covering a long period of years. The general mortality rate for the calendar year 1928 was 12.9, the rate for whites being 10.5 as compared with the rate of 21.6 for the colored. An average infant mortality rate of 64.6 was recorded; white 45.3, colored 107.4. The birth rate for white persons has shown a steady decline to 15.1 in 1928 as compared with 24 for the colored.

The tuberculosis death rate has shown a gradual decline among white persons, and the rate is about one-fifth that of the colored rate; 58.9 white, 256.3 colored, as compared with a rate of 102.9 for the white and 356.4 for the colored in 1917. One of the features of the tuberculosis clinic for both adults and children is the X-ray work. The Health Department has maintained a free X-ray clinic service under expert direction since 1918, during which time thousands of X-ray pictures have been taken for the guidance of clinicians. In 1929, 1,325 such pictures were taken for adults and 1,236 for children. During the year the Tuberculosis Association of the District of Columbia, a nonofficial organization, undertook a campaign to round up young children who had been known to be exposed to the infection of tuberculosis for the purpose of having them physically examined. This work was carried out under the auspices of the Tuberculosis Association with the coöperation of the Health Department. The tuberculosis contact clinic was in the same building as the adult tuberculosis clinic of the Health Department, and the records used were similar to those of the Health Department.

At the close of the year 1,406 dairy

farms shipping milk and cream into the District of Columbia were registered. The number of cattle on these farms was 28,425. The farms were inspected on an average of 5 times during the year. For 25 years the Health Department has made systematic use of the official dairy farm score card. The value of the methods employed is effectively illustrated by photographs of actual conditions on the dairy farms and in the milk plants arranged in the form of an effective exhibit in the Health Department office.

Territory of Hawaii—A comprehensive report of the Territorial Board of Health, covering 246 pages, contains interesting photographs, illustrating an intensive toxin-antitoxin immunization campaign, many valuable statistical tables, charts and maps, as well as a detailed financial statement. This Territory, with an estimated population of 357,649, records a birth rate of 32.5, a death rate of 16.5, and an infant mortality rate of 101.7. Reference is made to an undue prevalence of meningitis during the year, following the arrival of a steamer from the Orient on September 26, 1928. The peak was reached during the month of March when 68 cases were reported, of which 64 were among passengers of arriving vessels, including 2 from Army transports. During the year there were 198 cases with 68 deaths reported for this disease.

Through the coöperation of the Honolulu Chamber of Commerce and private agencies, funds were obtained to augment the limited appropriation of the Board of Health in the inauguration of a toxin-antitoxin immunization campaign. This campaign was successfully carried out through the coöperation of practicing physicians, government phy-



sicians, public health nurses, parent-teacher associations, the Free Kindergarten Association, Palama Settlement, and the principals and teachers of public and private schools. The results of this campaign are tabulated in detail in the report. In Honolulu alone, with a population of 113,000, 11,222 school children and 2,771 kindergarten children were immunized. On the Island of Hawaii, with a population of 82,134, 14,965 children of all ages were immunized. This is undoubtedly one of the most successful diphtheria immunization campaigns carried out during the past year.

A careful analysis is made of infant mortality according to districts in the various islands making up the Territory of Hawaii. There were conducted 1,260 child health conferences, with a total attendance of 22,308 children ranging from 3 weeks to 6 years of age. There were established 6 new health centers in the Territory during the year. One of the outstanding events in the public health nursing field was a series of 2 courses of 6 weeks each given to the nurses by the University of Hawaii Extension Division on Methods of Case Work. Space does not permit a more detailed review of interesting data recorded in this report.

**The Commonwealth Fund**—Devoting the major part of its income to activities in the fields of public health, preventive medicine, and mental hygiene, and to the enrichment of British-American relations, the Commonwealth Fund, according to its eleventh annual report, made appropriations totalling \$2,028,759 during the year ending last September 30. Among the year's developments were the opening of two new rural hospitals and the adoption of a new public health program in this country; the establishment of a child guidance clinic in London; and the completion of the Fund's child health program in Austria—the 6 years of co-

operative effort resulting in the cordial acceptance by the Austrian Government of responsibility for continuing practically all the activities conducted during that period. The last of a series of 4 child health demonstrations in the United States was within a few months of completion as the year ended.

Fellowships for graduates of British universities to study in America were increased from 25 to 35, of which 5 were open to students from the Dominions. A new group of 3 fellowships, which, like the original fellowships, are for 2 years each, was created for men of British descent who hold appointments in the British Government service overseas.

In the Fund's mental hygiene activities the year has been one of consolidation and technical progress. The Institute for Child Guidance, maintained by the Fund in New York City, received an increased number of children for treatment and enlarged its quota of students for professional training. The National Committee for Mental Hygiene was enabled to continue, through its Division on Community Clinics, advisory service to communities wishing to begin child guidance work and to establish clinics. Provision was similarly made for continuance of the service of the National Committee on Visiting Teachers, in promoting professional training in that field, presenting the elements of visiting teacher work to teachers and school administrators, carrying on a limited number of demonstrations, and giving counsel to interested communities.

With the opening of 2 new hospitals and the continued work of 2 previously established, 4 rural districts, 1 each in Tennessee, Virginia, Maine, and Kentucky, are now provided with general hospitals of their own, as a result of the Fund's activities. Additional hospitals have been opened in 2 more districts, in Kansas and Ohio, since the close of the

year covered by the report. It is estimated that through this program some 410,000 people are enabled to enjoy—near at home—the safety and convenience of hospital service which in former years they had to seek at a distance or forego altogether. The objectives of this program are far wider, however, than the provision of these facilities, for these constitute only the central part of a general attempt to raise the level of rural health through stimulating the medical profession and the public in the localities to develop practicable public health services suitably linked with the hospitals, and to foster an intelligent interest in preventive medicine.

The new public health program, with 1930 as its first year, will draw upon the experience both of the child health demonstrations and of the rural hospitals, but will provide a fresh approach to rural health problems. In an effort to encourage the development of both public health and general medical service in rural communities, specific contributions to professional education will be set up in each of two or three states. The projects, to be initiated and administered by the state health departments, will include the formation of a field staff to build up local health organizations and the establishment of well rounded health units in two selected districts. The educational projects will include the strengthening of the medical schools which chiefly train doctors for service in the selected states, scholarships or loan funds for students of medicine who intend to enter rural practice, and fellowships for rural physicians who wish to improve their grasp of the best current technic.

Among the special grants made by the Fund were several to be applied to medical research—for example, the study of the causes and treatment of cardiac trouble in children, at Johns Hopkins; a study of serums and vaccines significant for the control of car-

diac disorders, at Cornell University; the research work of the Heart Committee of the New York Tuberculosis and Health Association; an investigation at the University of Michigan looking toward the development of a blood test for tuberculosis; the study of epilepsy and multiple sclerosis at the New York Neurological Institute; and continued work on serum treatment for the pneumonias by William H. Park, M.D.

A grant of \$50,000 was made to the Notre Dame Bay Memorial Hospital, at Twillingate, Newfoundland, supplementing previous grants to this hospital, the only one in 300 miles of seacoast. The institution serves 50,000 people, mostly fishermen and their families, and has been successful in enlisting their confidence and support. The local community has already contributed more than \$80,000, besides much free labor. On one occasion 600 men gave 2 days' work to move a frame building three miles over snow and ice to provide a nurses' home.

San Jose, Calif.—Photographs and organization and statistical charts feature this 1929 report. This city, with an estimated population of 62,750, reports a birth rate of 13.8 and a death rate of 10.7, the average age at death being 53.8 years. A resident infant mortality rate of 44.4 is a gratifying record. The percentage of hospital births for the year was 70. Scarlet fever heads the list of communicable diseases with 351 cases and 1 death, but the low mortality indicates a mild form of the disease. There were 121 cases of whooping cough with 4 deaths and 49 cases of diphtheria with 2 deaths. A decrease was noted in the incidence of diphtheria among school children and the health officer attributes this change to the immunization work done in the schools. A financial statement indicates an expenditure for the year by the Health Department of \$19,363.

Greenville, S. C.—In the 1929 report the Board of Health makes a plea for more nurses for infant, prenatal and school work, and also for a meat and milk inspector. The estimated population for 1929 was 33,000 with a death rate of 10.6, a decrease over 1928 death rate of 15.5, a birth rate of 18.4 showing a slight increase over 1928. The infant mortality rate was 82.1, 71.1 for white and 107.1 for colored persons. The routine school examinations have been discontinued owing to the lack of personnel, but a nutrition worker assists the city schools and examines and aids undernourished children. A school den-

tist is still maintained. A baby and a prenatal clinic are held once a week for indigents, in connection with the city hospital—other clinics are the biological clinics held every day; orthopedic clinics, once a week; a mental hygiene clinic, once a week; and a tuberculosis clinic, one day for whites and another for colored.

A new water supply, at a cost of \$2,000,000, has been provided and \$1,500 has been appropriated for mosquito control. The important causes of death are heart disease with 134 deaths; tuberculosis with 40; and pneumonia with 28 deaths.

## BOOKS RECEIVED

INTRODUCTION TO HUMAN PARASITOLOGY. (4th ed.) By Asa C. Chandler. New York: Wiley, 1930. 655 pp. Price, \$5.00.

THE BIOLOGICAL BASIS OF HUMAN NATURE. By H. S. Jennings. New York: Norton, 1930. 384 pp. Price, \$4.00.

TOWARD CIVILIZATION. Edited by Charles A. Beard. New York: Longmans, 1930. 307 pp. Price, \$3.00.

SANITATION, HYGIENE, BACTERIOLOGY AND STERILIZATION. By Herman Goodman. New York: Medical Lay Press, 1929. 151 pp. Price, \$3.50.

HYGIENE FOR NURSES. By John Guy and G. J. I. Linklater. New York: Wood, 1930. 212 pp. Price, \$1.75.

A HEALTH REVIEW. A Pageant of Health Activities and Rules Adapted for Junior High Schools. By Margaret Strassler. New York: Barnes, 1930. 75 pp. Price, \$1.50.

GROWING STRAIGHT. A New System of Physical Education with Mental Control. By Maud Smith Williams. New York: Barnes, 1930. 137 pp. Price, \$2.00.

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PSYCHOLOGICAL AND PHYSIOLOGICAL APPARATUS AND SUPPLIES. Catalogue published by C. H. Stoelting Co., 424 N. Homan Ave., Chicago, Ill., 1930. 227 pp.

PILOTING YOUR LIFE. The Psychologist as Helmsman. By Joseph Jastrow. New York: Greenberg, 1930. 372 pp. Price, \$3.50.

HEALTH, PUBLIC AND PERSONAL. (New ed.) By Ralph E. Blount. Boston: Allyn & Bacon, 1930. 345 pp.

HITCH-HIKERS. By W. W. Peter and Grace T. Hallock. New York: Cleanliness Institute, 1930. 55 pp. Price, \$20.

THE MORPHINE HABIT AND ITS PAINLESS TREATMENT. By G. Laughton Scott. London: Lewis, 1930. 94 pp. Price, \$1.75.

DIABETES. Directions for Treatment by Insulin and Diet. By Benjamin F. Smith. New York: Appleton, 1930. 223 pp. Price, \$2.00.

NUTRIOLOGY. By J. Arthur Buchanan. Boston: Badger, 1930. 149 pp. Price, \$2.00.

CAMP SANITATION. Drinking Water Supply, Sewage and Refuse Disposal Swimming

# A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

## Fertility of Native White Women

—This summary of a paper appearing elsewhere points briefly to the conclusion that the rates of the least fertile rural class are higher than the most fertile urban class, and in both there is a definite inverse relation between fertility and social status.

ANON. Fertility of Native White Married Women in Various Social Classes as Shown by the Census Returns for 1910. *Quarterly Bull. (Milbank Memorial)*, 8, 2 (Apr.), 1930.

**College Student Health**—The physical condition in which students come to college is an interesting commentary on the hygienic ideas and practices in our better class homes. Five years' findings are recorded.

BEARD, J. H. Health in College Students. *Illinois Health Quarterly*, 2, 1: 21 (Jan.-Mar.), 1930.

**Nursing for British Insurance Policy Holders**—Steps leading to the formation of a Central Bureau of Industrial Nursing are recounted. The experience in American insurance company nursing was studied, followed, and then a method of consolidation effected.

CHARLEY, I. H. Nursing and Insurance in Great Britain. *Pub. Health Nurse*, 22, 4: 177 (Apr.), 1930.

**Federal Mental Hygiene Activities**—The activities of the U. S. Public Health Service in the field of mental hygiene are enumerated. The extent of these activities is little appreciated by most of us.

CUMMING, H. S. Mental Disorders and the Public Health. *Pub. Health Rep.*, 45, 14: 726 (Apr. 4), 1930.

**Diphtheria Prevention**—Had the diphtheria case and death rates prior to

the immunization campaign continued since, 237 cases and 11 deaths would have occurred in Brookline (Mass.). This saving at a cost of \$4,010 makes a satisfactory showing.

DENNY, F. P. Diphtheria Prevention in Brookline. *New Eng. J. Med.*, 202, 15: 716 (Apr. 10), 1930.

**Tuberculosis Rates**—Uncomfortable statistics for the "viewers-with-alarm" who have distressed themselves over the hygienic life of the flapper. An excellent analysis of New York City tuberculosis death rates by age, sex and color.

DROLET, G. J. Epidemiology of Tuberculosis in New York City. *J. Prev. Med.*, 4, 2: 115 (Mar.), 1930.

**Uses of Census Tracts**—Do you know what a census tract is? How Cleveland obtained its census tracts and what it is doing with them is a story which will interest the sanitarians who suppose that tracts have to do only with prohibition or morals.

GREEN, H. W. Facts, Figures and Fiction in Social and Health Statistics. *New Eng. J. Med.*, 202, 16: 771 (Apr. 17), 1930.

**Differentiation of the Streptococci**—Studies of the hemolytic streptococci are reviewed and lead the author to conclude that erysipelas and scarlet fever are as distinct etiologically as they are clinically.

HEKTOEN, L. Advances in the Study of Streptococci. *J. Bact.*, 19, 2: 57 (Feb.), 1930.

**Who Gets Diphtheria?**—Over 90 per cent of 703 (New Jersey) cases occurred among unprotected children. Of the 65 "immunized" persons reported, 20 had not completed treat-

ments, 13 became sick within 3 months of immunization. Only 5 of the remaining 32 had a subsequent Schick test. Of these 1 was positive, 1 not recorded, leaving only 3 who had had a known negative Schick reaction.

EAKINS, W. T. Who Gets Diphtheria Now-a-Days? *Pub. Health News* (New Jersey), 15, 4: 68 (Mar.), 1930.

**Psittacosis in England**—This is a detailed account of the disease of parrots replete with historical references and case studies of real interest to persons concerned with this baffling disease.

HUTCHINSON, R., *et al.* A Study of Psittacosis. *Brit. M. J.*, 3613: 633 (Apr. 5), 1930.

**Chlorin as a Milk Preservative**—Is there danger that farmers might use chlorin washing compounds as milk preservatives? Experimentally, chlorin was found inferior to formaldehyde, and hence not likely to be used illegally.

JOHNS, C. K. The Preservative Effect of Chlorin Compounds in Milk. *Canad. Pub. Health J.*, 21, 4: 162 (Apr.), 1930.

**Progress in Cancer Control**—Encouraging indeed is the report of the activities of the State Department's (Massachusetts) Division of Adult Hygiene. Who came to the state aided cancer clinics, in what condition and why they came is the most interesting part of the story.

LOMBARD, H. L. Annual Report of the Division of Adult Hygiene of the Massachusetts Department of Public Health. *New Eng. J. Med.*, 202, 15: 719 (Apr. 10), 1930.

**Canadian Health Administration**—This dissertation on full-time health organizations for Canada is an interesting supplement to our own efforts in the same direction.

McINTOSH, J. W. A Dominion Medical Service. *Canad. Pub. Health J.*, 21, 4: 177 (Apr.), 1930.

**Diet and Health**—Experimental and clinical evidences are presented to show

the importance of diet in relation to health and disease. A useful review of scientific opinion abroad.

MELLANBY, E. The Relation of Diet to Health and Disease. *Brit. M. J.*, 3614: 677 (Apr. 12), 1930.

**An English Opinion of Pasteurization**—Nature never meant milk to be heated. Pasteurization gives false sense of security; kills natural bactericidal substances in milk; does not always kill tubercle bacillus. Pasteurized microorganisms and manure cannot be good for babies. These are only a few of the specious arguments in a paper extolling raw milk.

MENTON, J. Bovine Tuberculosis in Relation to the Public Milk Supply. *Med. Off.*, 43, 14: 153 (Apr. 5), 1930.

**School Child Health**—Here is a truly stimulating paper; witness the following: "The school is an educational institution, not one of relief. . . . No free diphtheria immunization has been offered except to indigents. . . . The objective of school medical inspection should be the periodic examination on parental responsibility." Read it.

MOORE, F. Responsibilities of the Medical Profession in Health Program in Public Schools. *J. A. M. A.*, 94, 15: 1109 (Apr. 12), 1930.

**Rural Prenatal Program**—How to win the confidence of expectant mothers in a southern rural community where the "open spaces" are really great, is the theme of this interesting story.

PAGE, F. E. Prenatal Program in Franklin County, Ala. *Pub. Health Nurse*, 22, 4: 180 (Apr.), 1930.

**New York State Diphtheria Prevention**—What became of the slogan about no diphtheria after 1930? What was attempted in diphtheria control in New York is the burden of this excellent report. It seems that some diphtheria may be anticipated after 1930 despite

many worth while projects for which all due credit should be accorded.

SENFTNER, H. F. A Report on the Progress of the Upstate Diphtheria Prevention Campaign to Date. *New York State J. Med.*, 30, 6: 331 (Mar. 15), 1930.

**More about Toxoid**—Administered in three doses, 0.5, 1.0, and 1.5 c.c., 3 and 2 weeks apart, toxoid treatment resulted in producing a negative Schick test in 96–100 per cent of the cases Schick positive before immunization. The toxin-antitoxin proponents die hard.

RAMON, G., and HELLE, G. I. Anatoxin as an Immunizing Agent against Diphtheria. *Am. J. Dis. Child.*, 30, 4: 686 (Apr.), 1930.

**Whooping Cough Prophylaxis**—A Milwaukee children's home experienced an increased incidence of whooping cough despite prophylactic vaccination with *B. pertussis*. Both the institution and the city enjoyed a lower mortality.

SCHOWALTER, R. P. The Value of Vaccine in the Prevention of Whooping Cough. *Am. J. Dis. Child.*, 39, 3: 544 (Mar.), 1930.

**Diphtheria Immunization**—Another report of the superiority of toxoid over toxin-antitoxin as the agent of choice in the immunization of the preschool child against diphtheria.

SCHWARTZ, A. B., and JANNEY, F. R. The Comparative Value of Toxoid and Other Agents in the Immunization of the Preschool Child against Diphtheria. *Am. J. Dis. Child.*, 39, 3: 504 (Mar.), 1930.

**Control of Syphilis**—After discussing the potentialities in our largely ineffectual attempts to prevent the continued spread of syphilis, this author

proceeds to discuss treatment in its epidemiologic aspects. An excellent paper.

STOKES, J. H. Critical Treatment Problems in Syphilology. *J. A. M. A.*, 94, 14: 1029 (Apr. 5), 1930.

**Commercial Health Propaganda**—Not entirely disinterested is most of the recently awakened commercial activity in health promotion. Yet the results are good and are welcomed by health workers, says the writer.

TOBEY, J. A. Business Discovers Health. *Technology Rev.*, 32, 5: 2 (Mar.), 1930.

**Smoke Abatement and Ultra-Violet Light**—It appears that a complete return of the "health-giving rays of the sun" may not follow close upon the enforcement of smoke abatement measures applicable to existing combustion processes. The study was made in Chicago.

TONNEY, F. O., *et al.* Loss of Actinic Intensity in Urban Sunshine Due to Air Pollution. *J. Prev. Med.*, 4, 2: 139 (Mar.), 1930.

**Differentiating Streptococci**—Chocolate agar is suggested as a culture medium upon which the pathogenic streptococci may be differentiated.

TUNNICLIFF, R. Streptococci from Scarlet Fever, Erysipelas and Septic Sore Throat. *J. A. M. A.*, 94, 16: 1213 (Apr. 19), 1930.

**Preventorium Treatment and After-Care**—What happens to the children who go to their homes after an instructive period in a preventorium? This study by a Syracuse institution points to the great importance of adequate follow-up.

WISEMAN, J. R. Malnutrition. *Am. J. Dis. Child.*, 39, 4: 758 (Apr.), 1930.

## NEWS FROM THE FIELD

### TOKIO'S HOSPITAL

THE cornerstone of the Medical Center of St. Luke's International Hospital at Tokio, Japan, was laid on March 28. Much progress has been made on this new center, which has been described as an important factor in cementing friendship between Japan and the United States.

This institution has the support of the Japanese Government, although it is an American church institution, and the Emperor of Japan has contributed \$20,000 toward the fund for its construction.

This new center replaces the hospital which the earthquake of 1923 destroyed.

### MASSACHUSETTS INSTITUTE OF TECHNOLOGY

THE Fourth Public Health Institute for health officers and other public health workers will be held at the Massachusetts Institute of Technology from June 23 to July 12, 1930.

This Institute aims to provide for the health officer or other qualified public health worker an opportunity to study public health procedures and to examine modern public health practice under the direction of experts in the respective fields.

There will be lectures, round table discussions, conferences and numerous laboratory or clinical demonstrations or field trips.

### MENTAL HYGIENE IN ARGENTINA

ARGENTINA has recently evidenced recognition of the importance of mental hygiene by organizing a league of mental hygiene to study methods for the prevention of mental disorders and improvement in the treatment of mental patients. The league

will work for the application of mental hygiene principles in schools, industrial establishments, and elsewhere; organize mental hygiene conferences; and try to enlist the coöperation of the public authorities.

### VIENNA'S "MUTTERSCHULEN"

THE city of Vienna, Austria, has started schools for mothers in which they are taught about nutrition and nutritional disturbances, infectious diseases and protective inoculation, care of the new-born, and of well and sick children, mental hygiene of children, and the hygiene of sleep. Lessons on children's songs and games and the making of children's clothing may be added. The courses are under the direction of a woman physician and a woman welfare worker.

### COLORADO POST-GRADUATE COURSE IN PSYCHIATRY

A POST-GRADUATE course in neuropsychiatry is to be given at the Colorado Psychopathic Hospital, Denver, under the auspices of the University of Colorado School of Medicine and Hospitals beginning July 1 and ending July 31, 1930. The course is for physicians only and will include material on mental hygiene, the psychopathology of childhood, clinical psychiatry and neurology, mental testing, internal medicine, neuropathology, serology, biochemistry and roentgenology. The fee for the course will be \$125, and registration begins June 30.

### DR. HERMAN ADLER GOES TO CALIFORNIA

DR. HERMAN M. ADLER, Illinois state criminologist and director of the Juvenile Psychopathic Institute, has

accepted a professorship of psychiatry at the University of California, Berkeley, and an appointment as consultant to the California State Department of Institutions. Dr. Adler, who was assistant professor of psychiatry at Harvard University Medical School, went to Chicago in 1916 to study the facilities in Cook County for the detection and care of mental diseases, under the auspices of the Rockefeller Foundation and the National Committee for Mental Hygiene. His assistant for several years, Dr. Paul L. Schroeder, has been designated by the governor to succeed him.

#### FLORIDA SHORT COURSES IN WATER AND SEWAGE TREATMENT

THE Fourth Annual Meeting of the Florida Section, American Water Works Association, was held in Gainesville, Fla., on April 10 and 11. It was preceded by the first Short Course in Water and Sewage Treatment offered by the General Extension Division of the University of Florida, in conjunction with the Florida Section, American Water Works Association, and the Florida State Board of Health, on April 8 and 9. Enrollment for the Short Course considerably exceeded the expectations, 69 having registered during the 2 days in which it was given. Conforming with the request of the Association the Short Course will be made an annual affair, and the time will be extended to 4 or 5 days, thus permitting a more thorough treatment of the subjects discussed.

The registration for the Fourth Annual Meeting was the largest in the history of the section, about 125 being in attendance. During the 2-day session, 19 papers were presented and discussed.

#### SAFETY BROADCASTING

THE Third Series of National Broadcasts under the auspices of the National Safety Council opened April 25 with an address by Irving Fisher of

Yale University. The 13-week program, given on successive Friday evenings from 7:15 to 7:30, alternates timely safety discussions by noted men and women with safety playlets. The programs are given on eastern daylight saving schedules.

This is the third national network devoted to safety problems during the past year and a half. Twenty National Broadcasting stations, headed by WEAf, New York, are participating.

#### W. B. WHITE TO HEAD U. S. FOOD CONTROL OFFICE

DR. Ward B. White, director of the New York State Bureau of Chemistry, has accepted the position of chief of food control, Food and Drug Administration, U. S. Department of Agriculture, effective June 2. This appointment is to fill the vacancy caused by the death of Dr. R. W. Balcom.

Dr. White in his new duties will supervise and direct the scientific and technical work necessary in enforcing the Tea Act, the Import Milk Act, and the Federal Food and Drugs Act as applied to foods.

#### NEW YORK STATE PUBLIC HEALTH COMMISSION

ANNOUNCEMENT has been made of the appointment by Governor Roosevelt of a Special Health Commission to study and report upon the working of the public health law and the various state and local authorities dealing with the promotion of health. Dr. Livingston Farrand has been asked to serve as chairman of the Commission, which consists of 15 members.

In making the announcement, the Governor issued this significant statement:

As an agency for serving the needs of the people, government should not be a static force but should evolve to meet the changing and developing body of knowledge. This is particularly true in the field of public health in which, during the past decade or two, far-



reaching development of the scientific facts upon which governmental action is based makes particularly necessary a periodic examination of the extent to which the state is meeting the needs of the people in this vital field.

#### HARD OF HEARING CONFERENCE

THE American Federation of Organizations for the Hard of Hearing will hold its 11th Annual Meeting June 16-19 in New York, as guest of the pioneer organization in this field of social work, The New York League for the Hard of Hearing.

Twenty years ago this group of persons handicapped by impaired hearing organized themselves to study and solve their own problems. Their effort has developed into an international federation comprising nearly 100 organizations in the United States and Canada, carrying on a vigorous campaign of public education in aural hygiene, conservation of hearing, and proper educational and vocational provision for the child with impaired hearing.

Many outstanding scientific, medical and educational leaders are active members of the American Federation, and it is well represented on the White House Conference for Child Health and Protection. It was founded by Wendell C. Phillips, M.D., past president of the American Medical Association, and its president is Harvey Fletcher, Ph.D., also president of the American Acoustical Society. The conference meetings will be audible to hard of hearing persons through a remarkable invention of the Bell Telephone Laboratories.

#### SOUTHERN SOCIAL HYGIENE INSTITUTE

THE Southern States Regional Conference and Social Hygiene Institute were held in New Orleans, May 23-27, under the auspices of the Louisiana State Board of Health and the New Orleans Council of Social Agencies.

Among the speakers were Dr. Lloyd Thompson, Father Alphonse Schwitalla,

Dr. O. C. Wenger, Dr. James R. McCord, Dr. E. L. Swan, Dr. Walter Clarke, Edna Moore and Henrietta Additon.

#### NEW LABORATORY CAR

DR. J. C. GEIGER, Associate Professor of Epidemiology in the Medical Department of the University of California, and Epidemiologist of the Southern Pacific Railroad, accompanied by Mrs. Geiger, has been making a tour in the New Laboratory Car of the Southern Pacific Railroad appropriately named "Better Health." In the car he has attended the State Medical meeting at Phoenix and Tucson, Arizona, and the California State Medical Society meeting at Del Monte. We hope to give a description of this car in an early issue, with some details of the uses to which it is put.

#### MISSOURI PUBLIC HEALTH ASSOCIATION

THE following officers were elected at the general business session of the sixth annual meeting of the Missouri Public Health Association at Jefferson City on April 24:

President, Irl Brown Krause, State Board of Health, Jefferson City, Mo.; First Vice President, Anne Heisler, School of Public Health Nursing, Washington University, St. Louis, Mo.; Second Vice President, Dr. R. C. Haynes, County Health Officer, Marshall, Mo.; Secretary, Pearl McIver, Division of Public Health Nursing, State Board of Health of Missouri, Jefferson City, Mo.; Treasurer, Dr. John W. Williams, Jr., County Health Officer, Springfield, Mo.; Representative on the Governing Council of the American Public Health Association, R. L. Laybourn.

The Association went on record as endorsing the resolution passed by the West Virginia Public Health Association which recommended to the A. P. H. A. that a publication be provided which

would make available the papers presented at the meetings of various state health associations to all members of affiliated societies.

## PERSONALS

DR. WILLIAM G. HARRISON, Birmingham, Ala., was chosen president of the Alabama State Medical Association on April 18.

DR. JAMES N. BAKER was appointed State Health Officer of Alabama to take the place of Dr. Samuel W. Welch who died.

DR. FREDERIC W. SCHLUTZ has been appointed head of the department of pediatrics at the University of Chicago's south side clinics. He will also be director of the Bobs Roberts Memorial Hospital for Children, open about May 1.

DR. RALPH G. BEACHLEY has been appointed full-time health officer for Kent County, Md., with headquarters at Chestertown.

DR. ALONZO R. KEIFFER was given a bronze plaque on April 22, to celebrate his fiftieth year in the practice of medicine.

DR. H. L. SAYLER has been appointed City Health Officer of Des Moines, Ia., to succeed Dr. A. J. Lieber. Prior to Dr. Lieber's appointment, Dr. Sayler was Health Officer of this city for about 15 years.

## CONFERENCES

June 3-4, New Mexico Public Health Association, Albuquerque, N. M.

June 6-14, National Conference of Social Work, Boston, Mass.

June 9-14, Biennial Convention of the Three National Nursing Organizations, Milwaukee, Wis.

June 12-14, Western Branch of American Public Health Association, Salt Lake City, Utah

June 18-19, State and Provincial Health Authorities of North America, Washington, D. C.

June 20-21, Conference of the Surgeon General, Washington, D. C.

June 23-July 12, Fourth Public Health Institute, M. I. T., Cambridge, Mass.

June 26-27, Pennsylvania Sewage Works Association, State College, Pa.

October 27-30, American Public Health Association, Fort Worth, Tex.

## FOREIGN

June 21-28, Royal Sanitary Institute, 41st Congress and Health Exhibition, Margate, England

Aug. 3-9, Second International Congress for Sex Research, London, England

Aug. 4-9, International Veterinary Congress, London, England

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29 West 39th St., New York

# American Journal of Public Health

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## Health Aspects of Summer Recreation\*

CHARLES F. DALTON, M. D., F. A. P. H. A.

*Secretary Vermont Department of Public Health, Burlington, Vt.*

THE word "vacation" probably has as many varieties of meaning as there are persons who use it. To some it means two weeks of strenuous work and to others two weeks of doing nothing, with all kinds of variations between these extremes. And this is rightly so on account of the different occupations and different needs of the vacationists. The problem which must confront the individual is the choice of the proper kind of vacation to suit his needs. The problem of the state is to safeguard the places to which the vacationist goes.

### THE PROBLEM OF THE INDIVIDUAL

Most people look upon summer vacation as a change from their usual occupation, and some take the need of change so seriously that they overdo the matter and return to their homes not only not refreshed but actually sick. Unfortunately there are no standards by which one can be guided in making suggestions for the use of one's spare time in summer, but a few generalizations may be put down as bearing on the subject. To my mind the case should be governed by common sense, even though the enjoyment may be somewhat curtailed. The health aspect of summer recreation should be the first consideration of the individual in his decision, for here the state cannot help him.

For the sedentary worker who gets little physical exercise in his daily occupation, a sudden round of active tennis, golf, mountain climbing or water sports may be disastrous. On the other hand, a complete change from an active manual employment to a life of sleeping half a day and spending the remainder in a hammock will probably

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\* Read before the New England Health Institute, Boston, Mass., April 16, 1930.

tie up the body secretions to such an extent that he must resort to cathartics and correctives to maintain even a fairly comfortable existence. An office worker who immediately strips to a bathing suit and spends the day on a sunny beach, or in a boat or canoe, will probably spend the next several weeks treating his skin for sunburn and overcoming the consequent effects of loss of sleep and nervousness.

Dr. Harlow Brooks, in his book on *Angina Pectoris*, says:

The growing habit in America of taking vacations is a step in the right direction, but in many instances some . . . select for their vacation and diversion things which impose more strain than their habitual occupation. The physician will find on any golf course men, the subject of angina or other cardiac disease, who, under the delusion that they are benefiting their health, all untrained and unprepared from a physical standpoint, indulge in stresses and strains fitted for the young college athlete, but not for the mature, and frequently overly plump business or professional man who, six or seven days out of each week, sits at the desk, stands on the turbulent floor of the stock exchange, or under the tremendous stress of the operating room. Old men try to play tennis with their sons, to defeat them at handball, to outdistance them in swimming, to outclimb them in the mountains; many of them develop angina.

These examples are not exceptional nor are they confined to those of the less intelligent classes. The idea of the strenuous life is so much a part of our very existence that we not only work strenuously, but we rest strenuously, and we do everything with a disregard for moderation which in some cases amounts to extravagance. This is what might be called typically American.

The sensible and, therefore, moderate man, especially if he is of the age which is no longer counted among the young, will gradually taper his activity up to the incline from sedentary employment to active recreation, or down from manual labor to healthful rest. He will thus avoid upsetting his bodily functions and end his vacation improved, refreshed and invigorated. He will not try to change from a pale office man to a bronzed athlete in two weeks, nor will he expect a hardened muscular body to perform its function if the stimulation of work is suddenly cut off from his daily routine.

The question of food presents a problem for those who are able to leave home for a trip or vacation. The automobile family starts out with the plan of spending the night, with dinner and breakfast, at some hotel or tourist house, and lunch at some convenient place on the road. The first night, the menu looks inviting with several dishes not usual at home, and a hearty meal is eaten. In the morning instead of the cereal, roll and coffee breakfast on the home plan, the meal may include meats, vegetables and desserts such as would usually constitute a dinner. Lunch may be a sandwich and more coffee or some car-

bonated drink. In the meantime, the call of the road is so urgent that the calls of nature are ignored, or at least not properly attended to. A few days of this régime will turn the happiest family into a nervous, sickly crew, and some time elapses before the family health is regained. A similar story might be told about other forms of vacation. Could these people bring themselves to order their food so as to at least approximate their usual habits, the vacation health problem would be far on the way toward solution. The vacationist of two weeks or less must make use of sound judgment if his recreation is to result in improvement rather than detriment to his health.

To many men the summer is the time of catching up on the exercise which has been neglected during the winter months. The waist line, which has increased from one to three inches as a result of many banquets and much sitting in at bridge, must now be reduced to normal size, and the nerves and digestion which have suffered from similar causes must be repaired. The golf links and a bright spring Sunday give the incentive for a day's outing. At the end of the first nine holes one feels just loosened up and the temptation is great to continue the round once or twice more. The result is too frequently a lame back, sore muscles and a general indisposition to work during the rest of the week, not to mention the strain on the heart which has become flabby from lack of necessity to support such an effort. A gradual course, working up from only nine holes the first day to the more strenuous game later in the summer, is much better than attempting to begin at once where one left off in the fall. A few can stand the sudden exertion; the majority must begin slowly.

#### THE PROBLEM OF THE STATE

With the summer recreation industry increasing steadily from year to year, the state must assume the responsibility of making every location within its borders safe for vacation purposes. In accepting this added burden, the public health department acts not only in its capacity as guardian of the health of the community, but also as the protector of the good name of the state. This dual responsibility creates one of the situations where public health and economics are so intimately connected that they cannot be separated. The success with which the problem has been attacked is shown by the remarkably small number of communicable diseases contracted in recent years among the hundreds of thousands of tourists and recreation seekers. This is even more remarkable when one considers the unstandardized methods which are applied by the different departments. Efforts are directed toward (1) Sanitation of camping places, (2) supervision of food and water supplies, and (3) control of communicable diseases.

The difficulties connected with camp sanitation are numerous and exceedingly weighty. Being almost exclusively in rural sections, where sewage facilities are not available and water supplies are inadequately protected, every camp represents an individual problem. In Vermont we find it a frequent occurrence that a prospective camp manager buys or leases a beautiful piece of scenery and proceeds to locate his buildings without a thought of sanitation until the actual construction of a sewerage system is begun. Then he finds that the ground is not suitable for sewage disposal or the bathing beach is in danger of pollution or the water supply is liable to contamination. Finally the sanitary engineer of the State Health Department is called in to eliminate the trouble. Septic tank treatment with subsoil disposal will sometimes be effective, but in many camps subsequent chemical treatment of the effluent is necessary. Occasionally, only expert engineering advice and a considerable outlay of money can safeguard the premises.

Leaving out seashore resorts which cannot be considered in this paper, the list includes commercial boys' and girls' camps, adult camps, private camping grounds, municipal camps, tourist overnight camps, roadside eating stands and tourists' lodging houses. With the formidable array of inland recreation places, it is little wonder that the health departments are at a loss to know how to institute methods of control. It is also remarkable that, considering the millions of dollars annually spent at such places, the state legislatures continually fail to provide funds for their proper inspection and supervision. Fortunately the sense of decency which is inherent in most people often saves the day when health departments are powerless.

Various codes of rules have been promulgated for the regulation of summer camps, most of which are good as far as they go, but such rules often fail to take cognizance of the individual problems caused by the variety of conditions to be overcome. It is easy to make a rule that sewage must be disposed of in a sanitary manner, but the camp owner asks how it can be done in his particular location. It is a simple matter of routine to write down that the water supply must be ample and safe, but the spring, well, stream or lake depended upon may require some safeguard or additional source to furnish the proper amount or quality. Sleeping quarters of a certain kind may be called for but frequently the camp is already established, or farm buildings have been already prepared for occupancy.

There is need of personal inspection by persons who are able to report on conditions found, and make recommendations for the best methods of bringing these conditions to a satisfactory level.

## DISEASE CONTROL IN CAMPS

Outbreaks of communicable disease in boys' and girls' camps are distressing, both to camp owners and health authorities. The larger camps usually have facilities for isolation and medical or nursing attendance, but some of the smaller ones have no such arrangement. An example of the difficulty in managing such an outbreak occurred in a boys' camp in Vermont recently. Infantile paralysis was diagnosed in 2 boys, both of whom had been in the camp less than two weeks. The camp was made up entirely of tents, with no means of isolation, and in consequence about 100 boys were exposed to the disease. Arrangements were made to remove the patients at once, and an inspection was made of the entire camp population. This resulted in the discovery of 5 more who exhibited suspicious symptoms.

The question then arose as to the best method of handling the remainder. To keep all the boys together meant further exposure for all, and this we were unwilling to do. Finally, after consultation, it was decided to send all the boys to their homes at once. Every boy carried with him a letter to his parents explaining the situation, and at the same time a notification was sent to the State Departments of Health, giving the addresses of all boys within their jurisdiction. The 5 boys with symptoms were kept for several days, but none developed further manifestation, and they were subsequently returned to their homes by automobile with similar notifications. Two of these, however, later developed paralysis while they were being held in quarantine at home.

There was of course some criticism of our action in closing this camp under such circumstances, but I have yet to be informed of any safer procedure which might have been instituted.

At another camp where a resident physician was in attendance and an infirmary was available, 2 polio cases were simply quarantined on the premises and the camp allowed to continue as usual, with no further developments. Cases of measles, mumps and German measles have also been handled in the same way.

## THE TYPHOID CARRIER MENACE

With the improvement in the supervision of water supplies, typhoid fever from polluted water is practically unknown. The great typhoid menace is the possible appearance of a typhoid carrier among the food handlers. Some camps make a practice of employing local residents as cooks and waitresses, and where this is done it is always recommended that they select only typhoid-free persons, as far as history and repeated examinations are able to determine. Following the



recent Canadian epidemic of typhoid, much apprehension was felt lest some of the resulting carriers should find employment in the camps. Our department circularized all camp owners and all hotels in the state warning them of the danger and, so far as we know, not a single case occurred from this source of infection.

However, the typhoid carrier is not always within the camp. A few years ago, several cases of typhoid occurred in a large camp of girls, and exhaustive examination of all employees and other possible suspects failed to explain the source of infection. Close inquiry as to the camp routine revealed the fact that on certain days in the week, the girls went to a nearby town, where they bought fruit and confectionery, and following up this clue led to the examination of an Italian fruit dealer, whose place was frequently visited. This man proved to be a carrier and on the elimination of his wares no more cases occurred.

#### WAYSIDE EATING PLACES

Since the legislatures are largely made up of farmers or those interested in the farm vote, and small lunch places are frequently run in connection with farms, it is practically impossible to secure the passage of regulatory laws governing such places. The plan of securing funds for inspection by means of license fees seems to be working out satisfactorily in some states, but there is yet much to be done before the idea becomes a perfect working model. These places appear over night and in most unexpected locations, and their proper supervision would require many inspectors with restricted territories. The typhoid carrier menace exists as a potential danger at every one, and no amount of sanitary inspection will eliminate it. However, such inspection should be continued, but it should be supplemented by closely following up any cases which occur and by intensive education of the public. Campaigns directed toward wholesale inoculation against typhoid among those who may patronize such stands should also be inaugurated.

#### OVERNIGHT CAMPS AND LODGING HOUSES

The greater number of automobile tourists divide themselves between tourist rooming houses and the so-called "overnight" camps, which are provided with shacks or cottages of varying degrees of convenience. The competition of cities has resulted in the equipment of many municipal camping grounds, which are either free or may be occupied on payment of a small fee. Most of these are supplied with city water, shower baths and suitable toilet facilities and are generally supervised by the chamber of commerce or the park or street department of the city. They give little trouble to the health department.

The trouble comes from the farmer or rural resident, who happens to have a piece of land on or near the main highway, and suddenly decides that he can draw in a few dollars by opening a camp. A few rough shacks and a dry earth closet complete the equipment and he is ready for business.

Through some twist in human nature, this type of camp is quite largely patronized, particularly by people who start out with the idea of getting back to nature. Frequently one night in such a place is sufficient to disabuse their minds of the idea, but the next day brings others, and the owner's little investment becomes a paying proposition. Meanwhile, however, the camp site is becoming more unsanitary each time it is used and the outhouse more of a menace. Sometimes a stream is available for bathing, and the wash of excreta into this stream is neither seen by the campers nor regarded by the owner. The latter usually feels that he has done his duty if he picks up the papers and tin cans and throws them over the bank.

Of course the state is supposed to supervise all these places and render them safe and sanitary, but only those who have attempted such work realize how much organization would be required to fulfil adequately the expectations of the touring public. So long as there are sufficient numbers to make such a place profitable, there will always be the problem of controlling places of this class. Let us try the fee and license method, as is done in many states. It will probably accomplish something; but unless the health authorities can arrange for very frequent inspection and are furnished with power to forbid the use of unsuitable places, the public must still assume some responsibility if it continues to patronize camps of this type and condition.

A somewhat similar situation exists in regard to tourist rooming houses. Many of the houses available on the road are of the finest type and the accommodations such as would be found in the best of homes. But unfortunately there are others of a different kind, and one cannot always tell from the outside appearance what the inside will be like. Signs showing membership in, and approval by, this or that tourist association may or may not mean anything. Many of these houses are within city limits, some even in populous sections. In licensing these places, it seems that a distinction must be made between the rural and the urban, although they all display the same kind of signs. It is assumed that the cities will supervise the rooming houses within their borders and receive the fees therefrom, while the state assumes responsibility for the rural locations. But, again, it is evident that if these houses are to be kept properly under control, a large corps of inspectors will be required.

## WAYSIDE WATER SUPPLIES

The States of Michigan and Pennsylvania have been especially vigilant in inspection of wayside water supplies. These states have used traveling laboratories and plainly marked the safe and unsafe waters. Such outfits are rather too expensive for the New England States to operate unless some coöperative scheme can be devised, which is doubtful. There has been an effort, however, to protect tourists through the organizations which are available, and many such supplies have been marked within this territory. Many warnings have been given against promiscuous use of unknown water supplies, and tourists should by this time know the danger they run in drinking from wells, springs and streams of doubtful purity.

## A FEW RULES

A vacation should be a change in occupation, but not too radical a change in habits.

Let the change from winter's mild recreation to summer's active exercise be carefully graduated.

The daily menu on the trip should at least approximate the meals to which one is accustomed at home.

In so far as possible, use the whole summer to recoup the winter's losses in vitality rather than trying to do it all in an intensive two weeks.

A man of 50 cannot safely indulge in all the sports of a boy of 18.

Sufficient sleep is as necessary in summer as in winter.

Light clothing is desirable in hot weather, but a cool evening demands extra wraps.

The tired-out heart cannot suddenly take up the shock of an extra load.

Flabby muscles require graduated exercise to make them strong.

The summer cold is as uncomfortable as the winter gripe and almost as dangerous. Avoid it.

Look over the place where you propose to eat before ordering lunch.

Beware of wayside water supplies and farmhouse wells. Better carry a bottle of water from a protected source.

Habits of decency should not be forgotten in the country any more than at home.

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Automobile Deaths Follow Seasonal Movement

THERE is a definite seasonal movement in motor vehicle deaths, according to statistics released by the National Safety Council.

The fall months, beginning in September, are the peak of the year but the toll mounts steadily from April on through the ensuing 8 or 9 months.

As for all accidents, automobile fatalities are more frequent among men than women. In the age group from 20 to 24, the death rate among males is almost five times as high as that among females.

# Technical Supervision in the Production of Highest Quality Milk\*

JOHN G. HARDENBERGH, V. M. D.

*Director of Laboratories, The Walker-Gordon Laboratory Company, Inc.,  
Plainsboro, N. J.*

THE subject of supervision of milk supplies needs no lengthy introduction to emphasize the place which milk holds in the modern scheme of nutrition. Beginning with infancy and extending through the important stages of body growth to maturity, milk and its products have become established in the human dietary to an extent estimated to constitute one-fourth of the total expenditure for food of the average American family. Even this figure is below that recommended as ideal by physiologists, nutrition specialists and economists.

Accepting as a fact that milk is essential to the public health and welfare, it follows that an important place must be given to the supervision of milk production and distribution. In looking back, we find that three principal influences in the evolution of modern milk supplies had their inception some thirty years ago. These were: the work of Pasteur; the introduction of the tuberculin test of dairy cattle; and the pure milk movement initiated somewhat on a philanthropic basis by those who visualized and created what was known as "certified milk."

These three factors have exerted tremendous influence over a period of, roughly, thirty years and, to considerable extent, have reached the peaks of their development in that time. That the persons back of these discoveries and ideals realized the possibilities and future bearing of their efforts seems unlikely, yet concrete evidence of their effect upon the dairy industry is today abundantly available. In this country's more congested centers of population, pasteurization has become the generally accepted method of insuring the safety of fluid milk supplies that cannot be adequately protected by other means. The tuberculin test of dairy cattle has become a requirement in progressive communities whether or not pasteurization is practiced. The pure milk movement, conceived as a specialty,

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\* Read before Section on Medicine of the American Association for the Advancement of Science, Des Moines, Ia., December, 1929.

into account the element of human nature in following lines of least resistance and the preference in many places for raw milk.

The basic solution for the prevention of bovine tuberculous infection in man naturally rests in the eradication of the bovine disease. This is coming about very rapidly through the operation of the national coöperative program engaged in by the state and federal governments since 1917.

Pasteurization has played a big part in decreasing the incidence of bovine tubercle infection in man, but in a fundamental sense it has served only as a substitute for better means. The health authorities of Chicago recognized this when they made the requirement for tuberculin tested herds, even though the milk from them was to be pasteurized. The idea is becoming increasingly repugnant to all that any process can replace standards of health for dairy herds and dairy employees and standards of sanitation for dairy methods.

To those who are inclined to question the efficiency of the tuberculin test of dairy cattle it may be said that progressive dairymen are not concerned so much about the relatively small number of so-called no-lesion reactors removed from their herds as they are about the possibility of the occasional cow that may be actually infected and yet fail to react. On this point, a few data may be of interest.

In a large dairy herd which has been under federal and state supervision for a number of years, a considerable number of cattle are sold out of the herd each year to slaughter where they are subjected to post-mortem examinations under official inspection, particular attention being given to possible lesions of tuberculosis. Records are available covering the autopsy findings on 2,117 cows (negative to the tuberculin test) sold out of the herd during the past three years. Of these 2,117 cows, only 8, or 0.37 per cent, showed lesions that may have been tuberculous. Of these 8 cases, 2 animals showed calcification of the posterior mediastinal lymph nodes only; 2, hemorrhagic lesions only of the same nodes; 1, a small calcified lesion in the head; 1, calcified lesions on the exterior of the uterus; 1, a calcified lesion in a hepatic lymph node; and 1, skin lesions which proved to harbor acid-fast organisms resembling *Mycobacterium tuberculosis*.

It is interesting to note that not a single case was found in which the presence of a supposedly tuberculous lesion was of such a nature as to be significant either with respect to infection of the milk or to spread of the disease to other animals. The incidence of possible tuberculous lesions (0.37 per cent or 1 in 262) in cows negative to the tuberculin test indicates an efficiency which compares very satisfactorily with any other diagnostic test we know.

*Brucella abortus* infection.—The part that milk plays in the etiology of *Brucella* infections in man is extremely difficult to appraise at the present time. The state of our knowledge is nothing less than chaotic. Scarcely any two investigators may be found whose ideas are in accord as to the types of organisms isolated from human cases seemingly infected through milk, or who agree as to the exact methods for identification and differentiation of the various strains isolated. It has been very easy to ascribe cases of undulant fever to raw milk and it must be accepted that in some instances the infection has been so acquired. On the other hand, deliberate attempts to produce human infection through the ingestion of milk heavily inoculated with *Brucella abortus* have failed conspicuously.

Epidemiological studies have shown that, in a majority of cases, a history of consuming raw milk may be obtained but, in the same cases, at least 50 per cent had other contacts with *Brucella* infection. In certain sections of the country, Brucellosis in man is obviously milk-borne while in others it is just as obviously an occupational disease. It is a significant fact that those scientists who for many years have studied Bang abortion disease in cattle and related types of infection are the least willing to proffer set opinions and ready solutions for the problem. Therefore, it behooves those of us with lesser experience to be cautious and to await the results of more mature observations before attempting to prove the actual rôle played by milk.

However, so long as there remains a reasonable doubt and so long as milk is reputed to be a danger as a carrier of *Brucella* infections, the supervision of milk supplies must provide for adequate safeguards. This may be accomplished either by pasteurization or by elimination of *Brucella* infections in dairy herds. It must be borne in mind that neither of these systems will affect the complete control of human undulant fever, perhaps not even the major portion of such cases.

With respect to the elimination of Bang abortion disease from dairy herds, it has been demonstrated that the agglutination test is reliable for the detection of *Brucella abortus* infection. The removal of reacting animals will serve to remove those that are shedding the organism in the milk. Exceptions to this are so rare as to have no practical significance. In discussing the efficiency of the agglutination test, a statement has been repeated in medical literature to the effect that many cows eliminate *Brucella abortus* in milk and still fail to react to serum tests. This is a damaging criticism which is not supported by the facts, it being in the nature of a biologic impossibility to have localized infection in the udder without eventual transfer of agglutinins to the blood stream.

## HUMAN DISEASES TRANSMISSIBLE THROUGH MILK

In discussing the human diseases it is desired to consider two types of infection: the first, in which the infection of the milk may be direct, as in typhoid fever; the second, in which the infection may be indirect (from man to the udder), as in septic sore throat and scarlet fever.

In the case of typhoid fever, the human carrier is the element which must be eliminated. This is recognized in all well organized supervisory systems that control milk supplies, whether raw or pasteurized. It is essential that all milkers and milk handlers should be examined by suitable tests and every effort made to exclude the possible carrier. Milk has little if any bactericidal action against typhoid bacilli and not even pasteurization can be depended upon as an absolute safety factor if the carrier has access to the milk following the heat treatment. This was illustrated in San Francisco where the work of efficient pasteurization was nullified by a typhoid carrier who operated the bottling and capping machine.

Septic sore throat and scarlet fever are of special interest in milk control work because they present two possibilities in relation to milk infection: the infection may be direct as from a milker or other dairy employee, or it may be indirect as through the infection of a cow's udder by a human carrier. In the case of direct infection, it is not reasonable to suppose that any extensive epidemic could occur, inasmuch as it would be difficult for a human carrier to infect milk so grossly that any considerable portion of it would carry infective dosages. This is particularly true of large supplies wherein the ultimate dilution of any given direct contamination might easily make subsequent human infection an extremely remote possibility.

Furthermore, Jones<sup>1,2</sup> has shown in his studies of the influence of milk on the growth of scarlet fever streptococci, and in his studies of the bactericidal properties of milk, that certain streptococci of human origin are very susceptible to the effects of milk and that they fail to multiply in fresh unheated milk or in milk heated as high as 62° C. for 20 minutes. The significance of these observations lies in the reasonable supposition that no extensive epidemic of scarlet fever or septic sore throat can occur through the medium of direct human infection of a milk supply.

However, extensive infection of milk supplies with human types of streptococci can occur through the medium of the udder of the cow as a secondary host. This has been the case in several milk-borne epidemics of septic sore throat in which *S. epidemicus* has been inoculated, as it were, into one or more quarters of an udder by an infected

milker; the same occurrence has been noted at least once in the case of *S. scarlatinae*. The subsequent multiplication of these streptococci in the medium furnished by the milk and udder tissues may result in millions of these pathogens being discharged into the milk produced by the infected cow and so into the herd product, since there may be no immediate indication of resulting mastitis to warn the dairyman.

As a rule, in epidemics in which pathogenic streptococci of the human type have been traced to infected milk, we see the combination of a relatively small herd, perhaps only a few cows, the milk from which is sold raw; the presence of a cow with an infected udder; and methods of milk production which pay too little attention to minor udder disturbances and very little attention to the health of dairy employees. Under such conditions, it is possible for a milk supply to carry infective dosages of pathogenic organisms.

In large herds where the milk of any one cow may be mixed with the milk of, say, 100 other cows, the dilution factor may operate to reduce the chances of infective doses of pathogens. We know that such must be the case because cows harboring *S. epidemicus* have been found at a time when there was no occurrence of septic sore throat among the consumers of the milk.

The significance of hemolytic streptococci in milk may be said to depend almost entirely upon whether the species present are of bovine origin, incapable of producing disease in man, or whether they are of human origin, having gained entrance to the milk directly from a human carrier or indirectly through the medium of a cow whose udder has been infected by a human carrier.

So far as beta hemolytic streptococci of bovine origin are concerned, it has been shown that they are commonly found in mixed herd milks, both raw and pasteurized. Several species have been identified, the most frequently occurring being *S. mastitidis*, so named for its association with mastitis in cows. It may also be found living in the udders of cattle with no symptoms of udder inflammation. Its presence is not objectionable except as a possible indication of mastitis and it probably has no true significance as to human health.

Our knowledge of the characteristics of pathogenic types of hemolytic streptococci has been put to the most practical use in the modern laboratory methods for control of certified milk production. Today it is a routine procedure on a few certified milk farms to examine on blood-agar the milk from every fresh and new cow prior to admission to the milking line. In addition, the entire producing herds are checked at frequent intervals by means of group samples which are also plated in blood agar. The occurrence of any suspicious types



of streptococci in such a group sample is followed up by a recheck of the individual cows contributing to the group in order to locate the animal responsible. These laboratory control methods have been described in detail elsewhere.<sup>3,4</sup>

In this discussion of milk and its relation to the transmission of disease either of human or bovine origin, I have dealt only with some phases of the problem to which special significance is attached by sanitarians. The necessity for intelligent and effective supervision of milk supplies is evident. The supervision must primarily insure adequate protection for the public health and secondarily improve the quality of milk at the source.

Pasteurization has served an indispensable purpose in contributing a relatively high degree of safety to the milk supplies of the more thickly populated sections of the country. Properly applied, the process has a place and a value in the prevention of milk-borne disease that every progressive individual must recognize. With present standards for health and in the present state of development of our milk-production industry, the increasing demand for pasteurization is justified.

We must recognize, however, that neither the heat treatment of milk nor any other processing method removes the causes and defects which make pasteurization necessary. Neither does any heat processing treatment add to the intrinsic value of milk as a food product. These considerations are fundamental problems which leaders in the dairy industry are determined to solve in order that the milk production phase of the dairy industry may keep pace with other developments. The ideal that is being sought is that of a fundamentally sound milk embodying the highest possible attainments in safety, cleanliness and nutritional values at the source. Given such a product it may then be consumed raw or may be subjected to additional processing of proven benefit.

To a considerable extent, the basic principles underlying the production of the highest quality milk have been developed and demonstrated. As stated in the beginning, these requirements are related principally to production management and technical control of production. Production management begins with the fertilization of forage and grain crops to be fed dairy animals, includes the breeding and raising of dairy heifers free of disease, and oversees the feeding and care of the producing cows so that they operate at a maximum of efficiency. The production management must maintain the best conditions under which the cows are stabled and fed; such as cleanliness, ventilation, cleaning and bedding of the cows, condition of the feed and provision for water.

with thermophilic bacteria, which may cause spoilage of the canned product.

Refined sugar has proved to be an outstanding source of thermophilic spoilage bacteria. Sugar is the only ingredient of canned foods in which we have found spores of such bacteria with any degree of frequency. Usually this sugar contamination will not directly cause spoilage but it may result in inoculating the brine tanks or other equipment, where subsequent development may result. In one instance, we have evidence that sugar, highly contaminated with sulphide spoilage bacteria, was directly responsible for substantial loss. All three types of spoilage thermophiles have been found in sugar, but there is no apparent correlation between such contamination and the nature of the raw product (beet or cane) or the degree of refinement. We wish to emphasize the fact, however, that this thermophilic contamination of sugar is not a factor in spoilage in acid products like fruits or tomatoes, since the acidity prevents development of the spores.

No relation has been found between thermophilic spoilage or thermophilic contamination and sanitary conditions in the cannery. It is interesting to note that the same statement has been made with regard to the development of thermophilic contamination in pasteurizing equipment.

Spoilage by putrefactive anaerobes is relatively rare, and, unlike thermophilic spoilage, it may have some relation to sanitary conditions. Where we have studied this type of spoilage, it has resulted through the presence of spores in such things as conveyors and baskets made of porous materials. Soil is considered the source of these bacteria.

The most recent progress in spoilage control is based on prevention. Methods of examination have been developed by which products may be tested during the packing season and the canner told whether there are sources of infection in his equipment.

The methods which are used are selective and vary in reliability. The test for flat-sour bacteria is both practicable and reliable. The colonies are easily recognized and readily counted and are not to be confused with the usual soil-borne thermophilic types. The test for sulphide-spoilage bacteria is striking and is easily applied under field conditions. Colonies can be counted since they appear as intense black spots in the deep medium. The test for gas-forming thermophilic anaerobes is not so satisfactory since these types possess to a marked degree the peculiar property of delayed germination and we have been unable to prepare an ideal medium for their growth. Tests for putrefactive anaerobes are also subject to the limitation imposed

by delayed germination and are therefore largely qualitative. With these last two organisms, counting must be done by the method of dilution.

The problem has been to apply these routine methods of examination over a wide range of territory. A field laboratory has, therefore, been installed in a motor truck which has been in operation for two years. In the summer of 1928 more than 100 mid-west canning factories were covered, and during 1929 a somewhat less number were visited in eastern states.

This truck laboratory is located at central points, samples are collected from surrounding factories, iced and brought to the laboratory. Certain samples are taken from cans just after they have been sealed and before they are processed. These cans give a picture of what has taken place in the cannery in the way of infecting the food. Other samples are taken from various "key" points, such as the brine tanks, conveyors and blanchers, so that if contamination in the canned product is higher than it should be, the source may be traced.

The results of the work have thrown much light on the general subject of sources and methods of contamination and have been of value to individual canning organizations. While, up to the present time, most of the work has been done with canned peas and corn, it is being extended to other products.

While much emphasis has been laid in the past on the need of sanitary inspection of food factories, these studies have shown that something more than a superficial examination of canneries, raw materials and equipment is necessary to insure against spoilage. Canners are realizing more and more that bacteria are their chief enemies, and to keep them in check a bacteriological survey of the type above described is a great help.

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## Decline of Italian Birth Rate

ACCORDING to reports of the Istituto Centrale di Statistica, the number of births in Italy in 1929 was 1,035,866, or 32,700 less than the preceding year. The birth rate, which in 1928 was 26.08 per 1,000 population, dropped in 1929 to 25.09. The number of deaths in 1928 was 638,818 and in 1929, 660,609, an increase of 21,791. Hence, the mortality rose from 15.59 to 15.98. The excess of births over deaths was 357,257 in 1929, which signified a decrease of 54,491, as compared with 1928.

# The Well Baby Clinic at the Office of the Family Physician and Pediatrician\*

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WHEN the Minneapolis Infant Welfare Society was organized in 1910 for the purpose of conducting well baby clinics, the economic status of the parents was not considered, and any infant was welcomed. An intensive educational campaign was conducted so that parents might learn the value of such care. The number of new babies admitted increased each year until 1922 (see Table I), when, due partly to our own investigation (Table II) and partly to the protests of the organized medical profession, our policy of admitting all infants who applied was changed.

Thereafter parents earning \$130 to \$135 a month with only 1 child and no outstanding debts or obligations were not eligible but were referred to their family physician or pediatrician for well baby care. We feel that in the long run this is the fairest policy for an organization dependent on the Community Fund for support. Even though in some cases injustice is done to the individual infant needing well baby care—through unwillingness of parents to pay, or indifference of the physician to whom they are referred—we believe sound policy dictates that the private physician should perform this service, and that such cases should no longer be charged to the community.

In time the physician who is now ignorant of, or indifferent to, preventive well baby care will find himself obliged to give such service, especially as the younger medical graduates have received intensive training in this type of work. To open the eyes of this ignorant or indifferent type of physician is our greatest problem. Some quotations from physicians as reported by mothers to our nurses were:

"No need to bother with any doctor when the baby seems O. K."

"No need of physical examination."

"Clinic doctors are too fussy about babies."

"No use to come so often unless that baby is sick; I haven't time."

"Give him anything that agrees with him. Why experiment?"

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\* Read at a Joint Session of the American Child Health Association and the Child Hygiene Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 2, 1929.

TABLE I  
NEW BABIES ADMITTED TO CLINIC

Year	Resident Births	Infant Mortality Rate	New Babies Admitted	Year	Resident Births	Infant Mortality Rate	New Babies Admitted
1912	6,953	75.2	200	1921	9,436	55.9	3,074
1913	7,124	85.3	371	1922	9,548	53.0	2,659
1914	7,189	83.4	629	1923	9,712	53.8	2,559
1915	8,522	71.1	1,014	1924	9,751	53.4	1,738
1916	8,778	82.4	1,362	1925	9,423	60.8	1,698
1917	8,660	71.6	1,407	1926	9,192	56.3	1,515
1918	8,689	72.0	1,722	1927	8,620	46.5	1,398
1919	8,133	64.6	2,321	1928	8,348	51.0	1,416
1920	9,182	65.2	2,735				

"Use your own judgment; if breast milk does not agree with the baby try some other kind of milk."

These remarks should show why many parents are unwilling to pay for service which does not give them the information and assistance obtained from the free clinics.

The following is a report of a survey made in 1921 by the Minneapolis Infant Welfare Society.

*Group*—This consisted of 100 cases discharged from Infant Welfare Clinics because the nurse felt that the income of the family was enough to provide for this care by private physician.

*Purpose*—To find out how many of these 100 cases have consulted private physicians as advised by the nurse.

*Type of Wage Earner*—This included professional men such as dentists, teachers, ministers; experienced business men such as department managers, salesmen, bank tellers, skilled mechanics, and tradesmen.

*Salaries*—Salaries range from \$125.00 a month with 1 child, to \$350.00 a month with 4 children. (Salaries alone cannot be taken as an estimate, as the number of children and expenses will vary with every family.)

*Result*—There were 38 mothers consulting private physicians regularly: 17 a family physician, 21 a pediatrician; 62 are not consulting any doctor.

*Special Points*—Sixty-seven mothers said that they had a family doctor; 26 had none; and 7 were doubtful. (By family doctor we mean a regular physician to whom the family would turn in case of illness.) Thirteen cases plainly showed the need of special care other than that received from the family doctor; 8 showed the family physician did not care to coöperate with the clinic doctor when the mother was referred to him. Five mothers said they wished to go to a pediatrician but did not like to offend the family doctor; 3 went a few times and said they found it too expensive; 3 felt that they must make payments on home and furniture and could not afford it.

A similar survey is now being made and should show a larger percentage consulting their physician, and also a better type of care being given by the doctors.

While the relationships of the infant welfare society and private

physicians are discussed in terms of our local policy, do not get the idea that it is a purely local problem; on the contrary, infant welfare societies all over the country are battling with the same difficulty, and the solution is yet to be found. However, I believe that the best answer is for the private physician to undertake this work. If some do it poorly at present, we must give them more time. The training of older physicians has been so exclusively in the care of the sick that even such obvious preventive measures as vaccination against small-pox and the inoculation with toxoid or toxin-antitoxin for the prevention of diphtheria seem unimportant and unnecessary.

In private practice, my associate and I give well baby care as follows:

The infant is brought to the office about once every month for the first 9 months; then every 2 months until 13 months old; every 3 months for the balance of the 2d year; and thereafter twice a year, up to school age. The baby is weighed each time and accurate record kept of gains or losses. For the first 6 months the mother is shown how to nurse her baby, and how to express her breasts if the supply runs short; if artificial milk is necessary exact directions are handed her.

In these days of comparatively simple milk mixtures it is not necessary to send a nurse into the home to demonstrate the preparation of

TABLE II

REPORT OF SURVEY OF ONE-TENTH OF ALL REGISTERED CASES  
1922-1923

## 220 Cases

In 29 cases, 13.1 per cent, there was no income; either the baby was illegitimate or the father was unemployed

*Income less than \$100*

51, 23.1 per cent, were in this class  
33, 15 per cent, had 1 child  
11, 5 per cent, had 2 children  
2, 0.9 per cent, had 3 children  
5, 2.2 per cent, had 4 or more

*Income between \$100 and \$115*

55 cases, 25 per cent, were in this class  
29, 13.1 per cent, had 1 child  
12, 5.4 per cent, had 2 children  
6, 2.7 per cent, had 3 children  
8, 3.6 per cent, had 4 or more

*Income between \$116 and \$125*

46 cases, 20.4 per cent, were in this class  
26, 11.8 per cent, had 1 child  
11, 5 per cent, had 2 children  
6, 2.7 per cent, had 3 children  
3, 1.3 per cent, had 4 or more

*Income between \$126 and \$135*

18 cases, 8.1 per cent, were in this class  
8, 3.6 per cent, had 1 child  
2, 0.9 per cent, had 2 children  
4, 1.8 per cent, had 3 children  
4, 1.8 per cent, had 4 or more

*Income between \$136 and \$150*

14 cases, 6.3 per cent, were in this class  
2, 0.9 per cent, had 1 child  
4, 1.8 per cent, had 2 children  
3, 1.3 per cent, had 3 children  
5, 2.2 per cent, had 4 or more

*Income between \$151 and \$175*

7 cases, 3.1 per cent, were in this class  
1, 0.4 per cent, had 1 child  
2, 0.9 per cent, had 2 children  
3, 1.3 per cent, had 3 children  
1, 0.4 per cent, had 4 or more

milk formulas. The mother is directed when to start orange or tomato juice for the prevention of scurvy, and when to begin cod liver oil or viosterol for the prevention of rickets.

During the second 6 months instructions are given as to cereal and vegetable additions to the diet, so that by the time the infant is 10 or 12 months old, it is on three meals a day, and a fairly well mixed diet. During this time the baby is vaccinated and given toxin-antitoxin, the latter followed in 6 months by a Schick test. Through the 2d year the diet is expanded so that by the end the child is receiving all digestible foods in varied preparations.

For the 1st year the charge for this service if given regularly is about two-thirds of the fee for the casual office visit.

During the entire 5-year period mental hygiene instruction is given. The too indulgent or sympathetic mother, the over-stern father, and the nagging parents are dealt with by personal talks and by the required reading of simple popular books on child training, such as Thom's *Everyday Problem of the Everyday Child*, and Blanton's *Child Training*.

Conflicts in methods of discipline between parents are ironed out with varying success and sane sex instruction is urged. The trying problem of anorexia or poor appetite is explained in all its ramifications and early preventive measures along the lines suggested by Aldrich are undertaken. We feel very strongly that proper mental hygiene instruction undertaken very early and carried on through this entire 5-year period will prevent many serious problem cases of later years.

This is a rough outline, and we believe if this program is thoroughly and intelligently carried out preventive well baby care can be given fully as well by the private physician as by the infant welfare clinic.

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## Development of School Hygiene in France

CONSIDERABLE progress has been made in school hygiene in France in recent years. All the new schools built in the last decade comply with the requirements of hygiene. Through the efforts of a private society, "l'Hygiene par l'Exemple," one well equipped school is built in each department to serve as a model. The improvement is particularly noticeable in Paris and the other large cities where the new schools have large windows, electric lights, hot water heat, and other modern improvements.

Physical examinations of school children are given in Paris and other cities. A bill requiring such examinations throughout the country has been pending in Parliament for some time. School nurses are employed in Paris, and courses for their training have been established. A considerable number of open-air schools has been established.—*Pro Juventute, Zurich, May, 1930, p. 188.*

# Waterways Pollution\*

THE Conference of State Sanitary Engineers requested its Committee on Sanitary Conservation of Water Resources to submit a report proposing the elements of a model statute for the purpose of conserving water resources.

The committee did so at the meeting of the Conference in Chicago in October, 1928; it was discussed, revised, resubmitted and finally unanimously approved by the Conference.

The Committee on Sanitary Engineering included in a report submitted to the Conference of State and Provincial Health Authorities of North America at its meeting in Washington, D. C., on June 1, 1929, the aforesaid report as approved by the Conference of State Sanitary Engineers, and the Conference of State and Provincial Health Authorities of North America endorsed the principles set forth in said report.

The Committee on Waterways Pollution of the Public Health Engineering Section, American Public Health Association, deems this subject of such importance that the following report is practically identical with that approved by the Conference of State Sanitary Engineers in 1928, and endorsed as to principles by the Conference of State and Provincial Health Authorities of North America in 1929.

The Public Health Engineering Section is composed of engineers engaged in public health work and hence it is postulated that this section looks upon such statutes first for the protection of the public health; second, for the promotion of the public health and the general welfare.

Such statutes to be worth while must be practical, capable of enforcement, intended simultaneously to protect and improve streams, and not place undue burdens upon municipalities and industry. The expenditure of public and private moneys must be kept at a minimum compatible with benefits to the public derived therefrom. The demands of the public for proper expenditure of public funds generally exceed the moneys available from bond issues and taxation. The cost of manufacturing finished goods from raw materials of necessity must include the cost of industrial waste disposal and this is passed on to the consumer. Therefore, in considering statutes and their en-

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\* Report of the Committee presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-eighth Annual Meeting, October 3, 1929.



forcement the very hard facts of the economics of the matter cannot be overlooked.

In consideration of the above the following broad, general, fundamental ideas on legislation are submitted.

#### PURPOSE OF STATUTES

1. To protect now clean waters against menace to the public health and otherwise so far as is compatible with public interests and urban and industrial development.
2. To improve the sanitary condition of waters now more or less polluted.
3. To render waters increasingly useful to the public as
  - a. Sources of present and future public and municipal water supplies
  - b. Sources of water for industry and agriculture
  - c. Places for recreation in suitable locations

#### SCOPE OF STATUTORY JURISDICTION

1. Sewage disposal and public sewerage
2. Industrial waste disposal
3. Pollution of waters arising from the development of natural resources

#### ADMINISTRATION OF STATUTES

As the first and highest use of water is for drinking purposes and as pure drinking water is an essential to the protection of the public health, it is obvious that the administration of such statutes should generally be vested in the state department of health.

In some states local conditions may indicate the wisdom of creating a board or commission to administer such statutes.

As the problem of sewage disposal, sewerage systems, industrial waste disposal, the design and operation of treatment works and the study of the sanitary conditions of waters all involve engineering and its underlying sciences such as hydraulics, chemistry, bacteriology and biology, the department of health or the board or commission must have the services of an adequate bureau of engineering to study projects, conduct investigations, and make reports and recommendation on the manifold and diverse questions which arise. Of much moment is the need for adequate appropriations to finance such work.

#### GENERAL POLICIES

The statutes should provide for the submission of plans, relevant data and reports to the state authorities as to existing and proposed

1. Sewerage systems
2. Means of sewage disposal (including treatment works)

3. Sources, nature and amount of industrial wastes together with means of disposal (including treatment works or admission to sewer system)
4. Means of disposal for pollution arising from development of natural resources

Upon receipt of such data an engineering study and, if necessary, a field inspection should be made thereof to determine:

1. Compliance with sound engineering practice
2. Practicability and feasibility of the project
3. Sufficiency of the existing or proposed means of disposal or degree of treatment adequately to protect public interests in the use of the receiving body of water

If the project be found satisfactory the statute should empower the state authorities to issue to the applicant a formal permit:

1. Approving the plans or project "as is" or with such modifications as are deemed necessary
2. Stipulating the conditions under which the discharge is permitted or the works are to be operated

The statute should vest in the state authorities full jurisdiction over:

1. New or increased discharge of sewage
2. New discharge of industrial waste or increase in the pollution strength of existing discharge of industrial wastes
3. New pollution arising from the development of natural resources

It should vest in the state authorities discretionary police power in cases where existing discharge of sewage or industrial waste is demonstrated to constitute a menace to the public health or prejudicial to public interests.

#### IN RE SEWERAGE

Municipalities of sufficient size and population to warrant it should prepare, adopt and submit for approval to the state authorities a comprehensive sewerage plan to show at least:

1. All existing sewers
2. Proposed sewer extensions in those parts of the town site for which there is a city plan
3. Estimate of future rate of flow from now undeveloped parts of the town site in order that the main sewers and works of the comprehensive plan shall have adequate capacity
4. Studies as to the practicability and advisability of admitting sewage from outside the town but originating on the same drainage area
5. The admissibility "as is" or with preliminary treatment of industrial wastes to the public sewer system
6. Intercepting and outfall sewers to convey sewage to a suitable site for disposal or treatment
7. Where sewage is to be treated, plans of the necessary first units and general

outline plans sufficient to show the feasibility of extending the capacity of the works or providing for more refined treatment if and when needed

The statutes should enable municipalities to do the following:

1. Exercise the right of eminent domain to acquire land or rights needed for the construction of sewers, treatment works and appurtenances.
2. Issue bonds and create sinking funds to finance construction.
3. Assess the cost of main and branch sewers against abutting property owners.
4. Charge sewer rental to finance the operation, maintenance, enlargement or betterment of treatment works and appurtenances.
5. Establish a special sewerage fund by taxation or annual appropriation for the sole purpose of building and maintaining main sewerage systems and treatment works.
6. Enter into agreements with contiguous or neighboring municipalities for conveyance and disposal of sewage or for the joint construction, maintenance and operation of sewers, treatment works and appurtenances and for the equitable distribution of the costs thereof and for joint management of the commonly used works.

#### IN RE INDUSTRIAL WASTES

The statutes should empower the state authorities to take care of the following:

1. Order the installation of industrial waste treatment works in cases where "reasonable and practicable ways and means" are known and where the lack of such installation results in pollution of the receiving body of water which constitutes a menace to the public health or is prejudicial to public interests.
2. By themselves or in coöperation with industry, conduct investigations concerning industrial wastes, their treatment and disposal in cases where there are not now known "reasonable and practicable ways and means" for treatment and disposal.
3. Make scientific studies to determine the sanitary condition of water resources and their present and probable future uses to serve best the public interests.
4. Allocate water resources for various public uses so as to bring about the best and highest utilization of the several streams, lakes and parts thereof.

#### IN RE DEVELOPMENT OF NATURAL RESOURCES

There should be statutory authority vesting in the state authorities discretionary powers to regulate and control, so far as is reasonable and practicable, the pollution of water resources arising from the development of natural resources so as to foster simultaneously the utilization of mineral wealth and protect the streams draining such regions.

Factories can be located in suitable places, but mineral resources must be developed *in situ*.

## ADMINISTRATION AND ENFORCEMENT

Such statutes, powers and duties should be administered with even-handed justice to the end that the commonwealth, its municipalities, its citizens, and its industries are benefitted, not harmed.

To that end the state authorities should offer helpful counsel, lead the way, guide and direct rather than arbitrarily issue formal orders without considering the practicability of their being carried out.

However, when in the administration of the statutes it does become necessary to invoke the police power of the state and issue a formal order, it should be so worded and in such terms that, if not obeyed and the case comes before a court for adjudication, there will be no difficulty in the Attorney General proving to the court the justice and equity of the order so that it will be sustained even upon appeal.

No action should be started that cannot be successfully finished.

Fines and imprisonment for violation of such statutes may intimidate the smaller towns and corporations but in the last analysis they are merely punitive and the end result of the enactment and enforcement should be money spent on construction, rather than paid into a public treasury and the nuisance continued.

For wilful stream pollution from non-going concerns, as for example the heedless emptying of vats in an abandoned factory, or the discharge of unsaleable milk from a receiving station, a money fine is the only redress and acts as a deterrent to such a flagrant practice.

W. L. STEVENSON, *Chairman*

ERNEST BOYCE

ALMON L. FALES

J. K. HOSKINS

F. H. WARING

L. F. WARRICK

A. H. WIETERS

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## Special Inspectors of Child Labor in Czechoslovakia

ON February 26, 1930, the Minister of Social Welfare of Czechoslovakia issued a circular to the factory inspection authorities in which he announced that a special division had been established in his ministry for better enforcement of the child labor law. The work is to be carried out by inspectors selected from the regular factory inspection staff. These government inspectors are to coöperate with the trade unions of young workers. The circular states specifically that the work of the new division will not be limited to the enforcement of labor legislation but will also occupy itself with other welfare problems of young workers.—*Lehrlings-schutz, Jugend- und Berufsfürsorge*, Apr., 1930, p. 22.

# EDITORIAL SECTION

*Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.*

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## PSITTACOSIS

PSITTACOSIS does not rank very high in order of numerical importance among the diseases acquired by man from the lower animals, but it stands second to none in interest from the scientific point of view.

The disease was recognized in 1879 by Ritter, who was not only a keen clinician but a shrewd observer, as he recognized the etiological significance of birds; since that time isolated cases, and more or less extensive outbreaks have occurred in most countries of western Europe as well as on this side of the Atlantic.

Our present interest springs from the epidemic which had its inception in the United States at just about the turn of the year. Many cases were traceable to parrots presented as tokens of Yuletide greetings, but they were, in fact, carriers of the disease to many, and of death to a few.

Approximately 150 cases have occurred, with 25 fatalities. It is a very safe assumption that the true figures of incidence and fatality would be higher than those given, since unless one has the clue (and recognizes it) in the shape of a bird, usually a sick one, the case will certainly pass as atypical influenza or atypical pneumonia. The newspapers have rendered excellent service in calling attention to the outbreak; indeed, without their aid, many cases, perhaps the majority of those reported, would have appeared in morbidity and mortality records under other diagnoses.

During the past few months the disease has attracted attention

in South America, England and Germany, as well as this country; in each it has taken its toll among those exposed.

Once the disease is suspected the clinical diagnosis is relatively simple. The onset with chill, headache, and fever without catarrhal symptoms is suggestive; when such manifestations are followed by physical signs in the chest indicative of pneumonia, but unaccompanied by the usual symptoms of that disease, with the symptoms insignificant or out of proportion to the physical signs, the diagnosis may be considered as established. Laboratory methods are of little value in diagnosis, save perhaps that a low leucocyte count speaks against pneumonia of the ordinary sort.

As to the bird carriers, parrots stand first, parrakeets (love birds) next, and it is believed that canaries are not beyond suspicion. The presence of a bird—sick or well—should serve to put the physician and the health officer on guard. The bird usually is decidedly ill and often dies, but cases have occurred from association with birds showing little or no evidence of illness. Usually a newly acquired bird is the source of infection, though this is not always true.

The research work carried out during the present epidemic seems to exclude Nocard's bacillus (a member of the paratyphoid group) as the cause of the disease and points to a filtrable virus as the essential etiological agent.

Of great importance and interest have been the laboratory outbreaks. Infections of research workers have accounted for the death of Dr. William R. Stokes, of the Baltimore City Health Department, and of Harry B. Anderson, of the Hygienic Laboratory of the U. S. Public Health Service. The most extensive outbreak was that occurring at the Hygienic Laboratory. Eleven cases occurred, only 2 of which were due to direct exposure to infected birds. The exact mode of infection in the remaining 9 cases is unknown.

It is evident that we have in psittacosis a disease demanding much research, but the fact that the research is especially hazardous will not deter those carrying on the necessary investigations.

From the point of view of public health procedure the problem seems very simple. The individual may protect himself by refraining from keeping parrots and certain other birds, or from exposing himself to them. In the present state of our knowledge, an embargo on suspected birds seems to be the only solution, from the point of view of public health authorities, national and local, and indeed, it is a question whether all birds of the susceptible group should not be considered as coming under suspicion.

## WHAT IS THE SATURATION POINT FOR CITY NOISE?

THAT noise is unavoidable where people gather themselves together in communities is a fact as ancient as the man-made institution of cities and towns, but never before in the history of the world has there been such a constant clamor as is produced in modern cities or one made up of so many startling, alarm-like elements.

To a certain extent we can and do adapt ourselves to the conditions of noise, but common experience shows that there are limits to this adaptation. Everyone who has tried to sleep through the hum of after-theater traffic interspersed with nervous tooting of horns, through the rattle of milk delivery, through the clatter of ash collection—all the noises of a city night—knows that custom does not mitigate the annoyance caused by noise. Everyone who has tried to do a piece of work in the din of adding machines, typewriters, telephone bells and office conversation knows that he is disturbed by these things—at some times more than at other times, to be sure, but nevertheless appreciably disturbed. Business firms, realizing this disturbing effect of noise on workers, willingly spent over \$3,000,000 last year in the attempt to dampen office noises and exclude street noises.

The researches of psychologists so far have been a confirmation of this common experience, usually revealing that noise has been more of a handicap to rest and to work than the average man ever suspected.

One question has not been answered in laboratories and it is doubtful if it can be answered there, where conditions are sifted of many of the elements of everyday life: What is the saturation point for city noise—the point beyond which human adaptation cannot compensate for the tax noise levies on the attention, on the energy, and on the relaxation periods?

A pragmatic answer is given in the letters sent to the Health Department over a period of years complaining of noise in the five boroughs of Greater New York. The very fact that people have written these letters after a period of suffering is an answer to the question: How much noise can individuals stand?

We say, "after a period of suffering," advisedly. A study of these letters reveals that, while one out of twenty-five may be from a crank, the other twenty-four are from sensible people who have delayed making their complaints until they could endure conditions no longer. One letter, for example, tells of night riveting that had gone on for three months before the people in a neighboring apartment house decided to complain; another from the dean of women of a leading college protested against the clangor of street traffic that had disturbed a whole semester's work in the classrooms on the exposed side of the

buildings; and school principals had figures to prove the slowing up of the whole year's work by the constant disturbance of recitations by noise from outside. So it goes through the voluminous files that house these complaints—the majority of the complaints show that stable, serious people are disturbed by noise to the point where they feel that they cannot adapt themselves to it.

It seems significant that these people should turn for help to their department of health. With an instinctive logic, they recognize noise as a health problem—a serious hindrance to their well-being and efficiency. Whether or not noise has reached its worst proportions at this time, it surely has reached a point where something must be done to give people relief from it—something more than the abating of individual noises when and as complaints are made of them.

Another thing—significant of the way the noise nuisance has projected itself into the minds of thinking people as a problem that must be solved now—is the alacrity with which the members of the New York Noise Abatement Commission entered into their work. Not one of the fourteen men invited last October to serve on this commission—and they knew they would have much hard work to do—refused to perform his patriotic task. Doctors, lawyers, builders, engineers, executives of large organizations, all had found noise a great handicap in their varied work and had already given much thought to its curbing.

The noise survey of the city, conducted by the Noise Abatement Commission during its first four months, reveals tremendous peaks of noise at certain places and at certain hours—noise that piles up as high as 94 decibels down on Cortland Street where the radio shops are congregated, and 76 decibels at many of the street corners where cross town trucking is heaviest. This approaches the 100 decibel limit, which is the point where sound is so loud that it sets the ear tingling. This would seem to be a point where continued noise creates physical discomfort.

The survey further reveals that the din of traffic cluttered streets travels up as high as the thirtieth floor of office buildings and that a full medley of city noise reaches up even higher—to the very topmost floors of isolated skyscrapers.

Perhaps we cannot truly say that the noise of the city has reached the saturation point in view of the fact that there are still oases of comparative quiet—like the Mall in Central Park, the first set-back stories of the new style skyscrapers that are protected from street noise by the sound-shadow of the out-jutting stories below, and a few residence streets in Brooklyn where the sound of baby carriage wheels is recorded by the noise testing machines used in the survey.

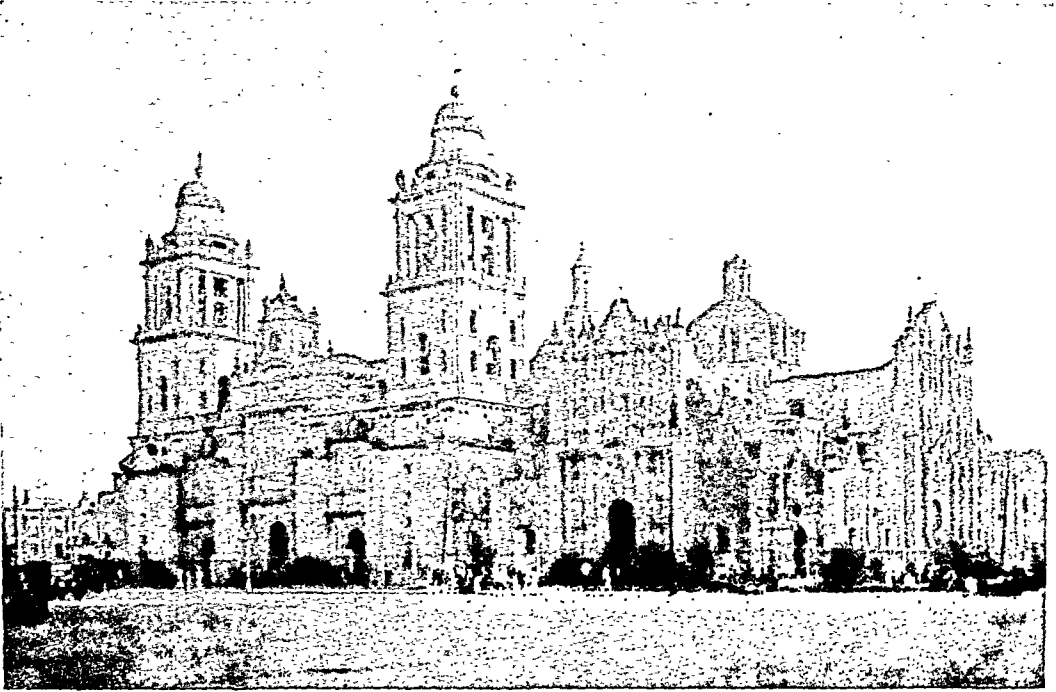


The fact remains that unnecessary noises surround most of the six million New Yorkers during all their working hours and most of their sleeping hours. Many people never have a chance to recover from the effects of one group of noises before they are exposed to another group. Already noises, or rather the causes of noise, are so closely interwoven with our economic and industrial life that it will take the combined ingenuity of builders, acoustical engineers, automobile builders, and lawyers to change present conditions without working hardship on any group in the community. Fortunately the Noise Abatement Commission is made up of men equipped by their life training to deal with the many ramifications of this modern public health problem and make New York a more comfortable, more livable city for all classes of people living in it.

### CONGRESS AUTHORIZES NATIONAL INSTITUTE OF HEALTH

THE bill for a National Institute of Health, which has been pending before Congress for several years, was passed late in May, and signed by the President. This measure, which had been endorsed by the American Public Health Association, changes the name of the Hygienic Laboratory of the U. S. Public Health Service to National Institute of Health, authorizes the appropriation of \$750,000 for its expansion, permits the government to accept unconditional gifts and donations for investigations of human diseases and public health conditions, and allows qualified scientists to be appointed fellows at the newly created Institute. The bill was sponsored by Senator Joseph E. Ransdell of Louisiana. It is gratifying to know that Congress is sufficiently interested in public health, in the midst of its discussions of the tariff and other important matters, to pass this measure.

# ASSOCIATION NEWS



*Cathedral, Mexico City*

## A NINE-DAY, ALL-EXPENSE TOUR WITH 5 DAYS IN MEXICO CITY,

FROM THURSDAY, MIDNIGHT, OCTOBER 30, TO SATURDAY, NOVEMBER 8, 1930

FOR MEMBERS OF THE AMERICAN PUBLIC HEALTH ASSOCIATION AND  
THEIR FAMILIES, FOLLOWING THE FIFTY-NINTH ANNUAL MEETING  
OF THE ASSOCIATION IN FORT WORTH, TEX., OCTOBER 27 TO 30, 1930

THE Chief of the Department of Health of the Republic of Mexico, Dr. Rafael Silva, has, in the name of the department and with the approval of the President of the Republic, invited the members of the American Public Health Association to visit Mexico City following the Annual Meeting in Fort Worth, for the purpose of meeting the public health workers of Mexico and participating in a scientific program of interest to American public health work-

ers. At the same time members of the Association are invited to be the official guests of the government at a number of entertainments.

In addition, the members of the Association in San Antonio, Tex., have invited the delegates to stop over for a visit in San Antonio and to participate in a brief meeting in that city.

In order to make the acceptance of this invitation convenient for the members of the Association and to reduce the

expense, an all-expense tour on a special train has been arranged.

The preliminary itinerary and program follow:

*Thursday, October 30—*

10.00 P.M.—Cars open—Fort Worth

*Friday, October 31—*

12.30 A.M.—Lv. Fort Worth

Breakfast on train

9.00 A.M.—Ar. San Antonio

9.15 A.M.—Tour of the city, visiting  
The Alamo, Medina Lake,  
etc.

12.15 P.M.—Return to Hotel

12.30 P.M.—Luncheon

Afternoon—At leisure

4.00 P.M.—Lv. San Antonio

Dinner on train

8.30 P.M.—Ar. Eagle Pass

*Saturday, November 1—*

Breakfast on train

8.00 A.M.—Ar. Monterrey—tour of city  
including El Canon,  
Bishop Palace, etc.

10.30 A.M.—Lv. Monterrey

Luncheon on train

Dinner on train

*Sunday, November 2—*

Breakfast on train

9.00 A.M.—Ar. Mexico City

9.30 A.M.—Excursion to San Juan Teo-  
tihuacan (Pyramids, Mu-  
seum and Garden)

12.00 M. —Luncheon, Gruta Restaurant,  
under auspices of Secre-  
tary of Public Education

2.00 P.M.—Return to Mexico City

4.00 P.M.—Folklore Pageant at Centro  
Venustrano Carranza  
(Outdoor Theatre) under

the auspices of Federal  
District of Mexico

Evening—At leisure

*Monday, November 3—*

9.30 A.M.—Meeting of the Delegation  
with the Department of  
Public Health of the Re-  
public of Mexico—Assem-  
bly High School Audito-  
rium or at the Department  
of Public Health

#### PROGRAM

1. Address of Welcome—DR. RAFAEL SILVA, Chief of the Department of Public Health of Mexico
  2. Reply to Address of Welcome—A. J. CHESLEY, M.D., President of A. P. H. A., HUGH S. CUMMING, M.D., Surgeon General of the U. S. Public Health Service, Washington, D. C., and J. C. ANDERSON, M.D., State Health Officer of Texas
  3. History of Health in Mexico—DR. ULISES VALDES, Secretary General of the Department of Public Health.
  4. Local Public Health Work—DR. MIGUEL BUSTAMANTE, Director of Health Unit at Vera Cruz, Ver.
  5. Display of film showing public health work in Mexico
- 1.00 P.M.—Luncheon
- 4.00 P.M.—Reception and meeting of President Ortiz Rubio, Chapultepec Castle
- 9.00 P.M.—Banquet and Dance, Auspices of Department of the Central Federal District of Mexico

*Tuesday, November 4—*

9.30 A.M.—Scientific session

#### PROGRAM

1. Address—W. S. RANKIN, M.D., *Chairman*, Executive Board, A. P. H. A., Duke Endowment, Charlotte, N. C.
  2. Address—B. J. LLOYD, M.D., Pan American Sanitary Bureau, Washington, D. C.
  3. Safeguarding a City Milk Supply—H. V. CARDONA, D.V.M., Supervisor of Milk Sanitation, Department of Public Health and Welfare, Fort Worth, Tex.
- 12.00 M. —Drive to the Desierto de los leones (Desert of Lions)  
Luncheon, under the auspices of the Secretary of Public Works



*Xochimilco's Floating Gardens*

2.00 P.M.—Return to Mexico City, with a tour of the city, including the Cathedral, The Plaza de Toros, Chapultepec Castle (the White House of Mexico and former home of Maximilian and Carlotta), etc.

Evening—At leisure

*Wednesday, November 5—*

9.30 A.M.—Tour of inspection of the beautiful new buildings of the National Department of Health

12.00 M. —Depart for Xochimilco—Luncheon under auspices of Department of Public Health

3.00 P.M.—Walk in Gardens and gondola tour of canals of Xochimilco

Inspection of Mexico City Water Supply

Evening—Concert

*Thursday, November 6—*

The delegates will be at leisure to make their own arrangements individually or in groups for additional sight-seeing or visits to places not included in the previous four days.

8.30 P.M.—Lv. Mexico City

*Friday, November 7—*

7.00 A.M.—Breakfast on train

12.00 M. —Luncheon on train

6.30 P.M.—Dinner on train

*Saturday, November 8—*

2.00 A.M.—Ar. Eagle Pass

7.00 A.M.—Ar. San Antonio

7.15 A.M.—Breakfast on train

12.00 M. —Luncheon on train

3.30 P.M.—Ar. Fort Worth

The total cost of the tour, including all expenses from Fort Worth to Mexico City and return to Fort Worth, with stop-over in San Antonio, including sight-seeing, transportation, all meals en route and during five days in Mexico City, all side trips, and the use of pullman cars in Mexico City, is to be as follows:

1 person in upper berth—\$112.40  
1 person in lower berth—\$149.90  
2 persons in lower berth—\$126.15 each  
2 persons in a section—\$131.15 each  
3 persons in a section—\$121.55 each  
2 persons in a compartment—\$169.90 each  
3 persons in a compartment—\$147.40 each  
2 persons in a drawing-room—\$189.90 each  
3 persons in a drawing-room—\$160.75 each

Assurance has been given that the most modern equipment will be used on the special train, including observation car, maid and valet service, shower bath, dining car, baggage car and probably a radio. An individual making the trip by himself would need to spend approximately \$250 to cover the same ground.

Application for a place in the delegation should be made on the following blank, and this sent to the Executive Secretary of the Association.

Homer N. Calver, Executive Secretary,  
American Public Health Association,  
370 Seventh Ave., New York, N. Y.

Please reserve in the Delegation of the A. P. H. A. to Mexico City .....

Space desired

I will be accompanied by .....

I am a member of the American Public Health Association .....

Please send me a membership application blank .....

Signed .....

Address .....

.....

by delayed germination and are therefore largely qualitative. With these last two organisms, counting must be done by the method of dilution.

The problem has been to apply these routine methods of examination over a wide range of territory. A field laboratory has, therefore, been installed in a motor truck which has been in operation for two years. In the summer of 1928 more than 100 mid-west canning factories were covered, and during 1929 a somewhat less number were visited in eastern states.

This truck laboratory is located at central points, samples are collected from surrounding factories, iced and brought to the laboratory. Certain samples are taken from cans just after they have been sealed and before they are processed. These cans give a picture of what has taken place in the cannery in the way of infecting the food. Other samples are taken from various "key" points, such as the brine tanks, conveyors and blanchers, so that if contamination in the canned product is higher than it should be, the source may be traced.

The results of the work have thrown much light on the general subject of sources and methods of contamination and have been of value to individual canning organizations. While, up to the present time, most of the work has been done with canned peas and corn, it is being extended to other products.

While much emphasis has been laid in the past on the need of sanitary inspection of food factories, these studies have shown that something more than a superficial examination of canneries, raw materials and equipment is necessary to insure against spoilage. Cannerymen are realizing more and more that bacteria are their chief enemies, and to keep them in check a bacteriological survey of the type above described is a great help.

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## Decline of Italian Birth Rate

ACCORDING to reports of the Istituto Centrale di Statistica, the number of births in Italy in 1929 was 1,035,866, or 32,700 less than the preceding year. The birth rate, which in 1928 was 26.08 per 1,000 population, dropped in 1929 to 25.09. The number of deaths in 1928 was 638,818 and in 1929, 660,609, an increase of 21,791. Hence, the mortality rose from 15.59 to 15.98. The excess of births over deaths was 357,257 in 1929, which signified a decrease of 54,491, as compared with 1928.

# The Well Baby Clinic at the Office of the Family Physician and Pediatrician \*

E. J. HUENEKENS, M. D.

*Director, Infant and Preschool Work, Infant Welfare Society, Minneapolis, Minn.*

WHEN the Minneapolis Infant Welfare Society was organized in 1910 for the purpose of conducting well baby clinics, the economic status of the parents was not considered, and any infant was welcomed. An intensive educational campaign was conducted so that parents might learn the value of such care. The number of new babies admitted increased each year until 1922 (see Table I), when, due partly to our own investigation (Table II) and partly to the protests of the organized medical profession, our policy of admitting all infants who applied was changed.

Thereafter parents earning \$130 to \$135 a month with only 1 child and no outstanding debts or obligations were not eligible but were referred to their family physician or pediatrician for well baby care. We feel that in the long run this is the fairest policy for an organization dependent on the Community Fund for support. Even though in some cases injustice is done to the individual infant needing well baby care—through unwillingness of parents to pay, or indifference of the physician to whom they are referred—we believe sound policy dictates that the private physician should perform this service, and that such cases should no longer be charged to the community.

In time the physician who is now ignorant of, or indifferent to, preventive well baby care will find himself obliged to give such service, especially as the younger medical graduates have received intensive training in this type of work. To open the eyes of this ignorant or indifferent type of physician is our greatest problem. Some quotations from physicians as reported by mothers to our nurses were:

"No need to bother with any doctor when the baby seems O. K."

"No need of physical examination."

"Clinic doctors are too fussy about babies."

"No use to come so often unless that baby is sick; I haven't time."

"Give him anything that agrees with him. Why experiment?"

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\* Read at a Joint Session of the American Child Health Association and the Child Hygiene Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 2, 1929.

TABLE I

## NEW BABIES ADMITTED TO CLINIC

Year	Resident Births	Infant Mortality Rate	New Babies Admitted	Year	Resident Births	Infant Mortality Rate	New Babies Admitted
1912	6,953	75.2	200	1921	9,436	55.9	3,074
1913	7,124	85.3	371	1922	9,548	53.0	2,659
1914	7,189	83.4	629	1923	9,712	53.8	2,559
1915	8,522	71.1	1,014	1924	9,751	53.4	1,738
1916	8,778	82.4	1,362	1925	9,423	60.8	1,698
1917	8,660	71.6	1,407	1926	9,192	56.3	1,515
1918	8,689	72.0	1,722	1927	8,620	46.5	1,398
1919	8,133	64.6	2,321	1928	8,348	51.0	1,416
1920	9,182	65.2	2,735				

"Use your own judgment; if breast milk does not agree with the baby try some other kind of milk."

These remarks should show why many parents are unwilling to pay for service which does not give them the information and assistance obtained from the free clinics.

The following is a report of a survey made in 1921 by the Minneapolis Infant Welfare Society.

*Group*—This consisted of 100 cases discharged from Infant Welfare Clinics because the nurse felt that the income of the family was enough to provide for this care by private physician.

*Purpose*—To find out how many of these 100 cases have consulted private physicians as advised by the nurse.

*Type of Wage Earner*—This included professional men such as dentists, teachers, ministers; experienced business men such as department managers, salesmen, bank tellers, skilled mechanics, and tradesmen.

*Salaries*—Salaries range from \$125.00 a month with 1 child, to \$350.00 a month with 4 children. (Salaries alone cannot be taken as an estimate, as the number of children and expenses will vary with every family.)

*Result*—There were 38 mothers consulting private physicians regularly: 17 a family physician, 21 a pediatrician; 62 are not consulting any doctor.

*Special Points*—Sixty-seven mothers said that they had a family doctor; 26 had none; and 7 were doubtful. (By family doctor we mean a regular physician to whom the family would turn in case of illness.) Thirteen cases plainly showed the need of special care other than that received from the family doctor; 8 showed the family physician did not care to coöperate with the clinic doctor when the mother was referred to him. Five mothers said they wished to go to a pediatrician but did not like to offend the family doctor; 3 went a few times and said they found it too expensive; 3 felt that they must make payments on home and furniture and could not afford it.

A similar survey is now being made and should show a larger percentage consulting their physician, and also a better type of care being given by the doctors.

While the relationships of the infant welfare society and private

physicians are discussed in terms of our local policy, do not get the idea that it is a purely local problem; on the contrary, infant welfare societies all over the country are battling with the same difficulty, and the solution is yet to be found. However, I believe that the best answer is for the private physician to undertake this work. If some do it poorly at present, we must give them more time. The training of older physicians has been so exclusively in the care of the sick that even such obvious preventive measures as vaccination against small-pox and the inoculation with toxoid or toxin-antitoxin for the prevention of diphtheria seem unimportant and unnecessary.

In private practice, my associate and I give well baby care as follows:

The infant is brought to the office about once every month for the first 9 months; then every 2 months until 13 months old; every 3 months for the balance of the 2d year; and thereafter twice a year, up to school age. The baby is weighed each time and accurate record kept of gains or losses. For the first 6 months the mother is shown how to nurse her baby, and how to express her breasts if the supply runs short; if artificial milk is necessary exact directions are handed her.

In these days of comparatively simple milk mixtures it is not necessary to send a nurse into the home to demonstrate the preparation of

TABLE II

REPORT OF SURVEY OF ONE-TENTH OF ALL REGISTERED CASES  
1922-1923

*220 Cases*

In 29 cases, 13.1 per cent, there was no income; either the baby was illegitimate or the father was unemployed

<i>Income less than \$100</i>	<i>Income between \$126 and \$135</i>
51, 23.1 per cent, were in this class	18 cases, 8.1 per cent, were in this class
33, 15 per cent, had 1 child	8, 3.6 per cent, had 1 child
11, 5 per cent, had 2 children	2, 0.9 per cent, had 2 children
2, 0.9 per cent, had 3 children	4, 1.8 per cent, had 3 children
5, 2.2 per cent, had 4 or more	4, 1.8 per cent, had 4 or more
<i>Income between \$100 and \$115</i>	<i>Income between \$136 and \$150</i>
55 cases, 25 per cent, were in this class	14 cases, 6.3 per cent, were in this class
29, 13.1 per cent, had 1 child	2, 0.9 per cent, had 1 child
12, 5.4 per cent, had 2 children	4, 1.8 per cent, had 2 children
6, 2.7 per cent, had 3 children	3, 1.3 per cent, had 3 children
8, 3.6 per cent, had 4 or more	5, 2.2 per cent, had 4 or more
<i>Income between \$116 and \$125</i>	<i>Income between \$151 and \$175</i>
46 cases, 20.4 per cent, were in this class	7 cases, 3.1 per cent, were in this class
26, 11.8 per cent, had 1 child	1, 0.4 per cent, had 1 child
11, 5 per cent, had 2 children	2, 0.9 per cent, had 2 children
6, 2.7 per cent, had 3 children	3, 1.3 per cent, had 3 children
3, 1.3 per cent, had 4 or more	1, 0.4 per cent, had 4 or more



milk formulas. The mother is directed when to start orange or tomato juice for the prevention of scurvy, and when to begin cod liver oil or viosterol for the prevention of rickets.

During the second 6 months instructions are given as to cereal and vegetable additions to the diet, so that by the time the infant is 10 or 12 months old, it is on three meals a day, and a fairly well mixed diet. During this time the baby is vaccinated and given toxin-antitoxin, the latter followed in 6 months by a Schick test. Through the 2d year the diet is expanded so that by the end the child is receiving all digestible foods in varied preparations.

For the 1st year the charge for this service if given regularly is about two-thirds of the fee for the casual office visit.

During the entire 5-year period mental hygiene instruction is given. The too indulgent or sympathetic mother, the over-stern father, and the nagging parents are dealt with by personal talks and by the required reading of simple popular books on child training, such as Thom's *Everyday Problem of the Everyday Child*, and Blanton's *Child Training*.

Conflicts in methods of discipline between parents are ironed out with varying success and sane sex instruction is urged. The trying problem of anorexia or poor appetite is explained in all its ramifications and early preventive measures along the lines suggested by Aldrich are undertaken. We feel very strongly that proper mental hygiene instruction undertaken very early and carried on through this entire 5-year period will prevent many serious problem cases of later years.

This is a rough outline, and we believe if this program is thoroughly and intelligently carried out preventive well baby care can be given fully as well by the private physician as by the infant welfare clinic.

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## Development of School Hygiene in France

CONSIDERABLE progress has been made in school hygiene in France in recent years. All the new schools built in the last decade comply with the requirements of hygiene. Through the efforts of a private society, "l'Hygiene par l'Exemple," one well equipped school is built in each department to serve as a model. The improvement is particularly noticeable in Paris and the other large cities where the new schools have large windows, electric lights, hot water heat, and other modern improvements.

Physical examinations of school children are given in Paris and other cities. A bill requiring such examinations throughout the country has been pending in Parliament for some time. School nurses are employed in Paris, and courses for their training have been established. A considerable number of open-air schools has been established.—*Pro Juventute, Zurich*, May, 1930, p. 188.

## Waterways Pollution\*

THE Conference of State Sanitary Engineers requested its Committee on Sanitary Conservation of Water Resources to submit a report proposing the elements of a model statute for the purpose of conserving water resources.

The committee did so at the meeting of the Conference in Chicago in October, 1928; it was discussed, revised, resubmitted and finally unanimously approved by the Conference.

The Committee on Sanitary Engineering included in a report submitted to the Conference of State and Provincial Health Authorities of North America at its meeting in Washington, D. C., on June 1, 1929, the aforesaid report as approved by the Conference of State Sanitary Engineers, and the Conference of State and Provincial Health Authorities of North America endorsed the principles set forth in said report.

The Committee on Waterways Pollution of the Public Health Engineering Section, American Public Health Association, deems this subject of such importance that the following report is practically identical with that approved by the Conference of State Sanitary Engineers in 1928, and endorsed as to principles by the Conference of State and Provincial Health Authorities of North America in 1929.

The Public Health Engineering Section is composed of engineers engaged in public health work and hence it is postulated that this section looks upon such statutes first for the protection of the public health; second, for the promotion of the public health and the general welfare.

Such statutes to be worth while must be practical, capable of enforcement, intended simultaneously to protect and improve streams, and not place undue burdens upon municipalities and industry. The expenditure of public and private moneys must be kept at a minimum compatible with benefits to the public derived therefrom. The demands of the public for proper expenditure of public funds generally exceed the moneys available from bond issues and taxation. The cost of manufacturing finished goods from raw materials of necessity must include the cost of industrial waste disposal and this is passed on to the consumer. Therefore, in considering statutes and their en-

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\* Report of the Committee presented to the Public Health Engineering Section of the American Public Health Association at the Fifty-eighth Annual Meeting, October 3, 1929.

forcement the very hard facts of the economics of the matter cannot be overlooked.

In consideration of the above the following broad, general, fundamental ideas on legislation are submitted.

#### PURPOSE OF STATUTES

1. To protect now clean waters against menace to the public health and otherwise so far as is compatible with public interests and urban and industrial development.
2. To improve the sanitary condition of waters now more or less polluted.
3. To render waters increasingly useful to the public as
  - a. Sources of present and future public and municipal water supplies
  - b. Sources of water for industry and agriculture
  - c. Places for recreation in suitable locations

#### SCOPE OF STATUTORY JURISDICTION

1. Sewage disposal and public sewerage
2. Industrial waste disposal
3. Pollution of waters arising from the development of natural resources

#### ADMINISTRATION OF STATUTES

As the first and highest use of water is for drinking purposes and as pure drinking water is an essential to the protection of the public health, it is obvious that the administration of such statutes should generally be vested in the state department of health.

In some states local conditions may indicate the wisdom of creating a board or commission to administer such statutes.

As the problem of sewage disposal, sewerage systems, industrial waste disposal, the design and operation of treatment works and the study of the sanitary conditions of waters all involve engineering and its underlying sciences such as hydraulics, chemistry, bacteriology and biology, the department of health or the board or commission must have the services of an adequate bureau of engineering to study projects, conduct investigations, and make reports and recommendation on the manifold and diverse questions which arise. Of much moment is the need for adequate appropriations to finance such work.

#### GENERAL POLICIES

The statutes should provide for the submission of plans, relevant data and reports to the state authorities as to existing and proposed

1. Sewerage systems
2. Means of sewage disposal (including treatment works)

3. Sources, nature and amount of industrial wastes together with means of disposal (including treatment works or admission to sewer system)
4. Means of disposal for pollution arising from development of natural resources

Upon receipt of such data an engineering study and, if necessary, a field inspection should be made thereof to determine:

1. Compliance with sound engineering practice
2. Practicability and feasibility of the project
3. Sufficiency of the existing or proposed means of disposal or degree of treatment adequately to protect public interests in the use of the receiving body of water

If the project be found satisfactory the statute should empower the state authorities to issue to the applicant a formal permit:

1. Approving the plans or project "as is" or with such modifications as are deemed necessary
2. Stipulating the conditions under which the discharge is permitted or the works are to be operated

The statute should vest in the state authorities full jurisdiction over:

1. New or increased discharge of sewage
2. New discharge of industrial waste or increase in the pollution strength of existing discharge of industrial wastes
3. New pollution arising from the development of natural resources

It should vest in the state authorities discretionary police power in cases where existing discharge of sewage or industrial waste is demonstrated to constitute a menace to the public health or prejudicial to public interests.

#### IN RE SEWERAGE

Municipalities of sufficient size and population to warrant it should prepare, adopt and submit for approval to the state authorities a comprehensive sewerage plan to show at least:

1. All existing sewers
2. Proposed sewer extensions in those parts of the town site for which there is a city plan
3. Estimate of future rate of flow from now undeveloped parts of the town site in order that the main sewers and works of the comprehensive plan shall have adequate capacity
4. Studies as to the practicability and advisability of admitting sewage from outside the town but originating on the same drainage area
5. The admissibility "as is" or with preliminary treatment of industrial wastes to the public sewer system
6. Intercepting and outfall sewers to convey sewage to a suitable site for disposal or treatment
7. Where sewage is to be treated, plans of the necessary first units and general

outline plans sufficient to show the feasibility of extending the capacity of the works or providing for more refined treatment if and when needed

The statutes should enable municipalities to do the following:

1. Exercise the right of eminent domain to acquire land or rights needed for the construction of sewers, treatment works and appurtenances.
2. Issue bonds and create sinking funds to finance construction.
3. Assess the cost of main and branch sewers against abutting property owners.
4. Charge sewer rental to finance the operation, maintenance, enlargement or betterment of treatment works and appurtenances.
5. Establish a special sewerage fund by taxation or annual appropriation for the sole purpose of building and maintaining main sewerage systems and treatment works.
6. Enter into agreements with contiguous or neighboring municipalities for conveyance and disposal of sewage or for the joint construction, maintenance and operation of sewers, treatment works and appurtenances and for the equitable distribution of the costs thereof and for joint management of the commonly used works.

#### IN RE INDUSTRIAL WASTES

The statutes should empower the state authorities to take care of the following:

1. Order the installation of industrial waste treatment works in cases where "reasonable and practicable ways and means" are known and where the lack of such installation results in pollution of the receiving body of water which constitutes a menace to the public health or is prejudicial to public interests.
2. By themselves or in coöperation with industry, conduct investigations concerning industrial wastes, their treatment and disposal in cases where there are not now known "reasonable and practicable ways and means" for treatment and disposal.
3. Make scientific studies to determine the sanitary condition of water resources and their present and probable future uses to serve best the public interests.
4. Allocate water resources for various public uses so as to bring about the best and highest utilization of the several streams, lakes and parts thereof.

#### IN RE DEVELOPMENT OF NATURAL RESOURCES

There should be statutory authority vesting in the state authorities discretionary powers to regulate and control, so far as is reasonable and practicable, the pollution of water resources arising from the development of natural resources so as to foster simultaneously the utilization of mineral wealth and protect the streams draining such regions.

Factories can be located in suitable places, but mineral resources must be developed *in situ*.

## ADMINISTRATION AND ENFORCEMENT

Such statutes, powers and duties should be administered with even-handed justice to the end that the 'commonwealth, its municipalities, its citizens, and its industries are benefitted, not harmed.

To that end the state authorities should offer helpful counsel, lead the way, guide and direct rather than arbitrarily issue formal orders without considering the practicability of their being carried out.

However, when in the administration of the statutes it does become necessary to invoke the police power of the state and issue a formal order, it should be so worded and in such terms that, if not obeyed and the case comes before a court for adjudication, there will be no difficulty in the Attorney General proving to the court the justice and equity of the order so that it will be sustained even upon appeal.

No action should be started that cannot be successfully finished.

Fines and imprisonment for violation of such statutes may intimidate the smaller towns and corporations but in the last analysis they are merely punitive and the end result of the enactment and enforcement should be money spent on construction, rather than paid into a public treasury and the nuisance continued.

For wilful stream pollution from non-going concerns, as for example the heedless emptying of vats in an abandoned factory, or the discharge of unsaleable milk from a receiving station, a money fine is the only redress and acts as a deterrent to such a flagrant practice.

W. L. STEVENSON, *Chairman*

ERNEST BOYCE

ALMON L. FALES

J. K. HOSKINS

F. H. WARING

L. F. WARRICK

A. H. WIETERS

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## Special Inspectors of Child Labor in Czechoslovakia

ON February 26, 1930, the Minister of Social Welfare of Czechoslovakia issued a circular to the factory inspection authorities in which he announced that a special division had been established in his ministry for better enforcement of the child labor law. The work is to be carried out by inspectors selected from the regular factory inspection staff. These government inspectors are to coöperate with the trade unions of young workers. The circular states specifically that the work of the new division will not be limited to the enforcement of labor legislation but will also occupy itself with other welfare problems of young workers.—*Lehrlingschutz, Jugend- und Berufsfürsorge*, Apr., 1930, p. 22.

## EDITORIAL SECTION

*Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.*

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## PSITTACOSIS

PSITTACOSIS does not rank very high in order of numerical importance among the diseases acquired by man from the lower animals, but it stands second to none in interest from the scientific point of view.

The disease was recognized in 1879 by Ritter, who was not only a keen clinician but a shrewd observer, as he recognized the etiological significance of birds; since that time isolated cases, and more or less extensive outbreaks have occurred in most countries of western Europe as well as on this side of the Atlantic.

Our present interest springs from the epidemic which had its inception in the United States at just about the turn of the year. Many cases were traceable to parrots presented as tokens of Yuletide greetings, but they were, in fact, carriers of the disease to many, and of death to a few.

Approximately 150 cases have occurred, with 25 fatalities. It is a very safe assumption that the true figures of incidence and fatality would be higher than those given, since unless one has the clue (and recognizes it) in the shape of a bird, usually a sick one, the case will certainly pass as atypical influenza or atypical pneumonia. The newspapers have rendered excellent service in calling attention to the outbreak; indeed, without their aid, many cases, perhaps the majority of those reported, would have appeared in morbidity and mortality records under other diagnoses.

During the past few months the disease has attracted attention

in South America, England and Germany, as well as this country; in each it has taken its toll among those exposed.

Once the disease is suspected the clinical diagnosis is relatively simple. The onset with chill, headache, and fever without catarrhal symptoms is suggestive; when such manifestations are followed by physical signs in the chest indicative of pneumonia, but unaccompanied by the usual symptoms of that disease, with the symptoms insignificant or out of proportion to the physical signs, the diagnosis may be considered as established. Laboratory methods are of little value in diagnosis, save perhaps that a low leucocyte count speaks against pneumonia of the ordinary sort.

As to the bird carriers, parrots stand first, parakeets (love birds) next, and it is believed that canaries are not beyond suspicion. The presence of a bird—sick or well—should serve to put the physician and the health officer on guard. The bird usually is decidedly ill and often dies, but cases have occurred from association with birds showing little or no evidence of illness. Usually a newly acquired bird is the source of infection, though this is not always true.

The research work carried out during the present epidemic seems to exclude Nocard's bacillus (a member of the paratyphoid group) as the cause of the disease and points to a filtrable virus as the essential etiological agent.

Of great importance and interest have been the laboratory outbreaks. Infections of research workers have accounted for the death of Dr. William R. Stokes, of the Baltimore City Health Department, and of Harry B. Anderson, of the Hygienic Laboratory of the U. S. Public Health Service. The most extensive outbreak was that occurring at the Hygienic Laboratory. Eleven cases occurred, only 2 of which were due to direct exposure to infected birds. The exact mode of infection in the remaining 9 cases is unknown.

It is evident that we have in psittacosis a disease demanding much research, but the fact that the research is especially hazardous will not deter those carrying on the necessary investigations.

From the point of view of public health procedure the problem seems very simple. The individual may protect himself by refraining from keeping parrots and certain other birds, or from exposing himself to them. In the present state of our knowledge, an embargo on suspected birds seems to be the only solution, from the point of view of public health authorities, national and local, and indeed, it is a question whether all birds of the susceptible group should not be considered as coming under suspicion.



## WHAT IS THE SATURATION POINT FOR CITY NOISE?

THAT noise is unavoidable where people gather themselves together in communities is a fact as ancient as the man-made institution of cities and towns, but never before in the history of the world has there been such a constant clamor as is produced in modern cities or one made up of so many startling, alarm-like elements.

To a certain extent we can and do adapt ourselves to the conditions of noise, but common experience shows that there are limits to this adaptation. Everyone who has tried to sleep through the hum of after-theater traffic interspersed with nervous tooting of horns, through the rattle of milk delivery, through the clatter of ash collection—all the noises of a city night—knows that custom does not mitigate the annoyance caused by noise. Everyone who has tried to do a piece of work in the din of adding machines, typewriters, telephone bells and office conversation knows that he is disturbed by these things—at some times more than at other times, to be sure, but nevertheless appreciably disturbed. Business firms, realizing this disturbing effect of noise on workers, willingly spent over \$3,000,000 last year in the attempt to dampen office noises and exclude street noises.

The researches of psychologists so far have been a confirmation of this common experience, usually revealing that noise has been more of a handicap to rest and to work than the average man ever suspected.

One question has not been answered in laboratories and it is doubtful if it can be answered there, where conditions are sifted of many of the elements of everyday life: What is the saturation point for city noise—the point beyond which human adaptation cannot compensate for the tax noise levies on the attention, on the energy, and on the relaxation periods?

A pragmatic answer is given in the letters sent to the Health Department over a period of years complaining of noise in the five boroughs of Greater New York. The very fact that people have written these letters after a period of suffering is an answer to the question: How much noise can individuals stand?

We say, "after a period of suffering," advisedly. A study of these letters reveals that, while one out of twenty-five may be from a crank, the other twenty-four are from sensible people who have delayed making their complaints until they could endure conditions no longer. One letter, for example, tells of night riveting that had gone on for three months before the people in a neighboring apartment house decided to complain; another from the dean of women of a leading college protested against the clangor of street traffic that had disturbed a whole semester's work in the classrooms on the exposed side of the

buildings; and school principals had figures to prove the slowing up of the whole year's work by the constant disturbance of recitations by noise from outside. So it goes through the voluminous files that house these complaints—the majority of the complaints show that stable, serious people are disturbed by noise to the point where they feel that they cannot adapt themselves to it.

It seems significant that these people should turn for help to their department of health. With an instinctive logic, they recognize noise as a health problem—a serious hindrance to their well-being and efficiency. Whether or not noise has reached its worst proportions at this time, it surely has reached a point where something must be done to give people relief from it—something more than the abating of individual noises when and as complaints are made of them.

Another thing—significant of the way the noise nuisance has projected itself into the minds of thinking people as a problem that must be solved now—is the alacrity with which the members of the New York Noise Abatement Commission entered into their work. Not one of the fourteen men invited last October to serve on this commission—and they knew they would have much hard work to do—refused to perform his patriotic task. Doctors, lawyers, builders, engineers, executives of large organizations, all had found noise a great handicap in their varied work and had already given much thought to its curbing.

The noise survey of the city, conducted by the Noise Abatement Commission during its first four months, reveals tremendous peaks of noise at certain places and at certain hours—noise that piles up as high as 94 decibels down on Cortland Street where the radio shops are congregated, and 76 decibels at many of the street corners where cross town trucking is heaviest. This approaches the 100 decibel limit, which is the point where sound is so loud that it sets the ear tingling. This would seem to be a point where continued noise creates physical discomfort.

The survey further reveals that the din of traffic cluttered streets travels up as high as the thirtieth floor of office buildings and that a full medley of city noise reaches up even higher—to the very topmost floors of isolated skyscrapers.

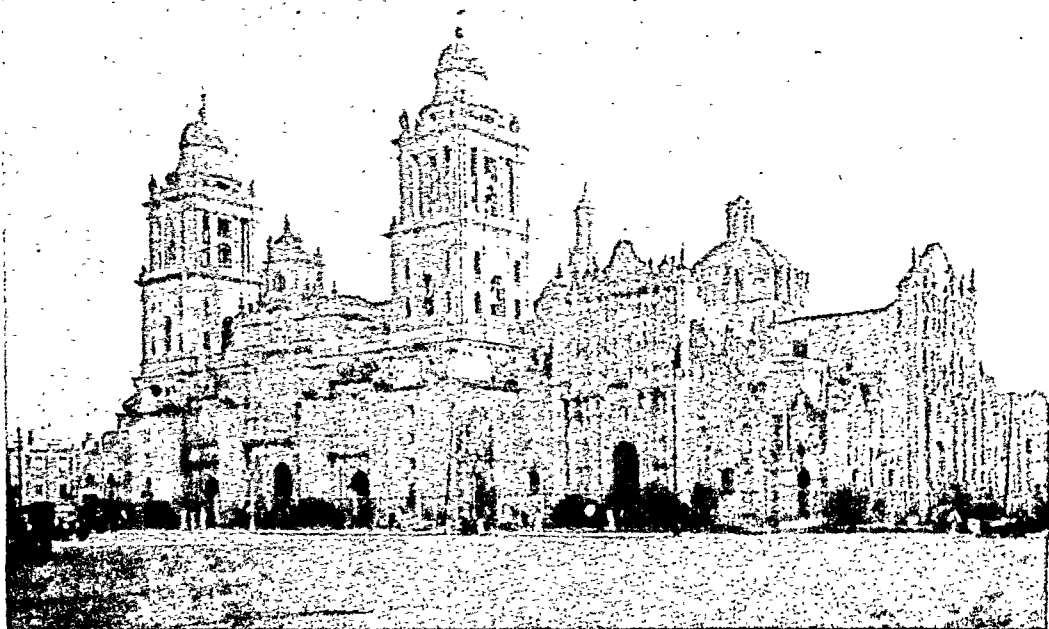
Perhaps we cannot truly say that the noise of the city has reached the saturation point in view of the fact that there are still oases of comparative quiet—like the Mall in Central Park, the first set-back stories of the new style skyscrapers that are protected from street noise by the sound-shadow of the out-jutting stories below, and a few residence streets in Brooklyn where the sound of baby carriage wheels is recorded by the noise testing machines used in the survey.

The fact remains that unnecessary noises surround most of the six million New Yorkers during all their working hours and most of their sleeping hours. Many people never have a chance to recover from the effects of one group of noises before they are exposed to another group. Already noises, or rather the causes of noise, are so closely interwoven with our economic and industrial life that it will take the combined ingenuity of builders, acoustical engineers, automobile builders, and lawyers to change present conditions without working hardship on any group in the community. Fortunately the Noise Abatement Commission is made up of men equipped by their life training to deal with the many ramifications of this modern public health problem and make New York a more comfortable, more livable city for all classes of people living in it.

### CONGRESS AUTHORIZES NATIONAL INSTITUTE OF HEALTH

THE bill for a National Institute of Health, which has been pending before Congress for several years, was passed late in May, and signed by the President. This measure, which had been endorsed by the American Public Health Association, changes the name of the Hygienic Laboratory of the U. S. Public Health Service to National Institute of Health, authorizes the appropriation of \$750,000 for its expansion, permits the government to accept unconditional gifts and donations for investigations of human diseases and public health conditions, and allows qualified scientists to be appointed fellows at the newly created Institute. The bill was sponsored by Senator Joseph E. Ransdell of Louisiana. It is gratifying to know that Congress is sufficiently interested in public health, in the midst of its discussions of the tariff and other important matters, to pass this measure.

## ASSOCIATION NEWS



*Cathedral, Mexico City*

A NINE-DAY, ALL-EXPENSE TOUR WITH 5 DAYS IN  
MEXICO CITY,

FROM THURSDAY, MIDNIGHT, OCTOBER 30, TO SATURDAY, NOVEMBER 8, 1930

FOR MEMBERS OF THE AMERICAN PUBLIC HEALTH ASSOCIATION AND  
THEIR FAMILIES, FOLLOWING THE FIFTY-NINTH ANNUAL MEETING  
OF THE ASSOCIATION IN FORT WORTH, TEX., OCTOBER 27 TO 30, 1930

THE Chief of the Department of Health of the Republic of Mexico, Dr. Rafael Silva, has, in the name of the department and with the approval of the President of the Republic, invited the members of the American Public Health Association to visit Mexico City following the Annual Meeting in Fort Worth, for the purpose of meeting the public health workers of Mexico and participating in a scientific program of interest to American public health work-

ers. At the same time members of the Association are invited to be the official guests of the government at a number of entertainments.

In addition, the members of the Association in San Antonio, Tex., have invited the delegates to stop over for a visit in San Antonio and to participate in a brief meeting in that city.

In order to make the acceptance of this invitation convenient for the members of the Association and to reduce the

expense, an all-expense tour on a special train has been arranged.

The preliminary itinerary and program follow:

*Thursday, October 30—*

10.00 P.M.—Cars open—Fort Worth

*Friday, October 31—*

12.30 A.M.—Lv. Fort Worth

Breakfast on train

9.00 A.M.—Ar. San Antonio

9.15 A.M.—Tour of the city, visiting The Alamo, Medina Lake, etc.

12.15 P.M.—Return to Hotel

12.30 P.M.—Luncheon

Afternoon—At leisure

4.00 P.M.—Lv. San Antonio

Dinner on train

8.30 P.M.—Ar. Eagle Pass

*Saturday, November 1—*

Breakfast on train

8.00 A.M.—Ar. Monterrey—tour of city including El Canon, Bishop Palace, etc.

10 30 A.M.—Lv. Monterrey

Luncheon on train

Dinner on train

*Sunday, November 2—*

Breakfast on train

9.00 A.M.—Ar. Mexico City

9.30 A.M.—Excursion to San Juan Teotihuacan (Pyramids, Museum and Garden)

12.00 M. —Luncheon, Gruta Restaurant, under auspices of Secretary of Public Education

2.00 P.M.—Return to Mexico City

4.00 P.M.—Folklore Pageant at Centro Venustiano Carranza (Outdoor Theatre) under

the auspices of Federal District of Mexico

Evening—At leisure

*Monday, November 3—*

9.30 A.M.—Meeting of the Delegation with the Department of Public Health of the Republic of Mexico—Assembly High School Auditorium or at the Department of Public Health

#### PROGRAM

1. Address of Welcome—DR. RAFAEL SILVA, Chief of the Department of Public Health of Mexico
  2. Reply to Address of Welcome—A. J. CHESLEY, M.D., President of A. P. H. A., HUGH S. CUMMING, M.D., Surgeon General of the U. S. Public Health Service, Washington, D. C., and J. C. ANDERSON, M.D., State Health Officer of Texas
  3. History of Health in Mexico—DR. ULISES VALDES, Secretary General of the Department of Public Health.
  4. Local Public Health Work—DR. MIGUEL BUSTAMANTE, Director of Health Unit at Vera Cruz, Ver.
  5. Display of film showing public health work in Mexico
- 1.00 P.M.—Luncheon
- 4.00 P.M.—Reception and meeting of President Ortiz Rubio, Chapultepec Castle
- 9.00 P.M.—Banquet and Dance, Auspices of Department of the Central Federal District of Mexico

*Tuesday, November 4—*

9.30 A.M.—Scientific session

#### PROGRAM

1. Address—W. S. RANKIN, M.D., *Chairman*, Executive Board, A. P. H. A., Duke Endowment, Charlotte, N. C.
  2. Address—B. J. LLOYD, M.D., Pan American Sanitary Bureau, Washington, D. C.
  3. Safeguarding a City Milk Supply—H. V. CARDONA, D.V.M., Supervisor of Milk Sanitation, Department of Public Health and Welfare, Fort Worth, Tex.
- 12.00 M. —Drive to the Desierto de los leones (Desert of Lions)  
Luncheon, under the auspices of the Secretary of Public Works



*Xochimilco's Floating Gardens*

2.00 P.M.—Return to Mexico City, with a tour of the city, including the Cathedral, The Plaza de Toros, Chapultepec Castle (the White House of Mexico and former home of Maximilian and Carlotta), etc.

Evening—At leisure

*Wednesday, November 5—*

9.30 A.M.—Tour of inspection of the beautiful new buildings of the National Department of Health

12.00 M. —Depart for Xochimilco—Luncheon under auspices of Department of Public Health

3.00 P.M.—Walk in Gardens and gondola tour of canals of Xochimilco  
Inspection of Mexico City Water Supply

Evening—Concert

*Thursday, November 6—*

The delegates will be at leisure to make their own arrangements individually or in groups for additional sight-seeing or visits to places not included in the previous four days.

8.30 P.M.—Lv. Mexico City

*Friday, November 7—*

7.00 A.M.—Breakfast on train

12.00 M. —Luncheon on train

6.30 P.M.—Dinner on train

*Saturday, November 8—*

2.00 A.M.—Ar. Eagle Pass

7.00 A.M.—Ar. San Antonio

7.15 A.M.—Breakfast on train

12.00 M. —Luncheon on train

3.30 P.M.—Ar. Fort Worth

The total cost of the tour, including all expenses from Fort Worth to Mexico City and return to Fort Worth, with stop-over in San Antonio, including sight-seeing, transportation, all meals en route and during five days in Mexico City, all side trips, and the use of pullman cars in Mexico City, is to be as follows:

1 person in upper berth—\$112.40  
1 person in lower berth—\$149.90  
2 persons in lower berth—\$126.15 each  
2 persons in a section—\$131.15 each  
3 persons in a section—\$121.55 each  
2 persons in a compartment—\$169.90 each  
3 persons in a compartment—\$147.40 each  
2 persons in a drawing-room—\$189.90 each  
3 persons in a drawing-room—\$160.75 each

Assurance has been given that the most modern equipment will be used on the special train, including observation car, maid and valet service, shower bath, dining car, baggage car and probably a radio. An individual making the trip by himself would need to spend approximately \$250 to cover the same ground.

Application for a place in the delegation should be made on the following blank, and this sent to the Executive Secretary of the Association.

Homer N. Calver, Executive Secretary,  
American Public Health Association,  
370 Seventh Ave., New York, N. Y.

Please reserve in the Delegation of the A. P. H. A. to Mexico City .....

Space desired

I will be accompanied by .....

I am a member of the American Public Health Association .....

Please send me a membership application blank .....

Signed .....

Address .....

.....

expense, an all-expense tour on a special train has been arranged.

The preliminary itinerary and program follow:

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8.00 A.M.—Ar. Monterrey—tour of city  
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10.30 A.M.—Lv. Monterrey

Luncheon on train

Dinner on train

*Sunday, November 2—*

Breakfast on train

9.00 A.M.—Ar. Mexico City

9.30 A.M.—Excursion to San Juan Teo-  
tihuacan (Pyramids, Mu-  
seum and Garden)

12.00 M. —Luncheon, Gruta Restaurant,  
under auspices of Secre-  
tary of Public Education

2.00 P.M.—Return to Mexico City

4.00 P.M.—Folklore Pageant at Centro  
Venustiano Carranza  
(Outdoor Theatre) under

the auspices of Federal  
District of Mexico

Evening—At leisure

*Monday, November 3—*

9.30 A.M.—Meeting of the Delegation  
with the Department of  
Public Health of the Re-  
public of Mexico—Assem-  
bly High School Auditor-  
ium or at the Department  
of Public Health

#### PROGRAM

1. Address of Welcome—DR. RAFAEL SILVA, Chief of the Department of Public Health of Mexico
  2. Reply to Address of Welcome—A. J. CHESLEY, M.D., President of A. P. H. A., HUGH S. CUMMINS, M.D., Surgeon General of the U. S. Public Health Service, Washington, D. C., and J. C. ANDERSON, M.D., State Health Officer of Texas
  3. History of Health in Mexico—DR. ULISES VALDES, Secretary General of the Department of Public Health.
  4. Local Public Health Work—DR. MIGUEL BUSTAMANTE, Director of Health Unit at Vera Cruz, Ver.
  5. Display of film showing public health work in Mexico
- 1.00 P.M.—Luncheon
- 4.00 P.M.—Reception and meeting of President Ortiz Rubio, Chapultepec Castle
- 9.00 P.M.—Banquet and Dance, Auspices of Department of the Central Federal District of Mexico

*Tuesday, November 4—*

9.30 A.M.—Scientific session

#### PROGRAM

1. Address—W. S. RANKIN, M.D., *Chairman*, Executive Board, A. P. H. A., Duke Endowment, Charlotte, N. C.
  2. Address—B. J. LLOYD, M.D., Pan American Sanitary Bureau, Washington, D. C.
  3. Safeguarding a City Milk Supply—H. V. CARDONA, D.V.M., Supervisor of Milk Sanitation, Department of Public Health and Welfare, Fort Worth, Tex.
- 12.00 M. —Drive to the Desierto de los leones (Desert of Lions)  
Luncheon, under the auspi-  
ces of the Secretary of  
Public Works



*Xochimilco's Floating Gardens*

2.00 P.M.—Return to Mexico City, with a tour of the city, including the Cathedral, The Plaza de Toros, Chapultepec Castle (the White House of Mexico and former home of Maximilian and Carlotta), etc.

Evening—At leisure

*Wednesday, November 5—*

9.30 A.M.—Tour of inspection of the beautiful new buildings of the National Department of Health

12.00 M. —Depart for Xochimilco—Luncheon under auspices of Department of Public Health

3.00 P.M.—Walk in Gardens and gondola tour of canals of Xochimilco

Inspection of Mexico City Water Supply

Evening—Concert

*Thursday, November 6—*

The delegates will be at leisure to make their own arrangements individually or in groups for additional sight-seeing or visits to places not included in the previous four days.

8.30 P.M.—Lv. Mexico City

*Friday, November 7—*

7.00 A.M.—Breakfast on train

12.00 M. —Luncheon on train

6.30 P.M.—Dinner on train

*Saturday, November 8—*

2.00 A.M.—Ar. Eagle Pass

7.00 A.M.—Ar. San Antonio

7.15 A.M.—Breakfast on train

12.00 M. —Luncheon on train

3.30 P.M.—Ar. Fort Worth

The total cost of the tour, including all expenses from Fort Worth to Mexico City and return to Fort Worth, with stop-over in San Antonio, including sight-seeing, transportation, all meals en route and during five days in Mexico City, all side trips, and the use of pullman cars in Mexico City, is to be as follows:

1 person in upper berth—\$112.40  
1 person in lower berth—\$149.90  
2 persons in lower berth—\$126.15 each  
2 persons in a section—\$131.15 each  
3 persons in a section—\$121.55 each  
2 persons in a compartment—\$169.90 each  
3 persons in a compartment—\$147.40 each  
2 persons in a drawing-room—\$189.90 each  
3 persons in a drawing-room—\$160.75 each

Assurance has been given that the most modern equipment will be used on the special train, including observation car, maid and valet service, shower bath, dining car, baggage car and probably a radio. An individual making the trip by himself would need to spend approximately \$250 to cover the same ground.

Application for a place in the delegation should be made on the following blank, and this sent to the Executive Secretary of the Association.

Homer N. Calver, Executive Secretary,  
American Public Health Association,  
370 Seventh Ave., New York, N. Y.

Please reserve in the Delegation of the A. P. H. A. to Mexico City .....

Space desired

I will be accompanied by .....

I am a member of the American Public Health Association .....

Please send me a membership application blank .....

Signed .....

Address .....

.....



## PLACES OF INTEREST IN DELEGATES' OWN TIME

**Guadalajara**—This city, with a population of 180,000, is the capital of the state of Jalisco, and has an elevation of 5,200 ft. above sea level. It is the second city in size and importance in the Republic. It is known for its many fine buildings, churches and homes. In and near Guadalajara are points of interest considered some of the most attractive in the Republic, including the wonderful falls some 5 miles from the city, and Lake Chapala some 20 miles from the city. Guadalajara is an overnight ride by train from Mexico City.

**Puebla**—A round trip can be made to the city of Puebla by automobile or bus in one day very comfortably, over the paved highway from Mexico City some 75 miles distant. Puebla has a population of over 100,000 with an elevation of 7,100 feet above sea level. It is noted for its Cathedral and Royal Chapel. Other points of interest near Puebla include the Pyramid of Cholula, which has a direct relation to the Pyramid of San Juan Teotihuacan near Mexico City.

**Cuernavaca**—This is a celebrated health resort, a mecca for tourists out of Mexico City. Cuernavaca has 7,000 to 10,000 population. A magnificent new paved highway from Mexico City to Cuernavaca, 40 miles distant, leads through some of the most wonderful scenery in this area. The highway leaves the valley of Mexico and crosses the mountain range at an elevation of between 10,000 and 11,000 feet above sea level and then descends to Cuernavaca with an elevation of 4,500 feet above sea level. This city is noted for many points of interest, including the home of former Ambassador Dwight Morrow, the original Palace of Cortez, the famous Borda Gardens and the Cathedral, one of the oldest and quaintest churches in the Republic, built in 1529, also caverns and river falls nearby. The round trip from Mexico City can be made comfortably by automobile or bus in one day.

**Veracruz**—Population is 100,000. Veracruz is one of the oldest and most historical cities in the Republic and formerly was the chief seaport. The trip from Mexico City to Veracruz by rail is through a mountainous section with some of the most picturesque scenery,

and can be made in one day and return overnight. Veracruz has also recently inaugurated a substantial full-time health department serv-



*Castle of Chapultepec*

ice, jointly through the federal health service, the state health service and with the cooperation of the International Health Board. This work is being carried on under the direction of Señor Alfonso Isunza and Dr. M. E. Bustamante.

**NOTE:** Other trips may be arranged for those having more time to such points as the two snow capped peaks that can be seen from Mexico City at all times, namely: Popocatepetl and Ixtlaccihuatl. Popocatepetl rises 17,782 feet and The Sleeping Lady (Ixtlaccihuatl) 16,060 feet above sea level. Not to have gazed awe-struck at these peaks from various points of vantage is to have missed two of the most inspiring scenic beauties of the world.

**Monterrey**—The Capital of the State of Nuevo Leon has a population of 150,000. Its altitude is 1,500 feet. This center for corn, beans, garbanzas and wheat is a busy commercial city with many factories. The principal points of interest are the Government Palace; the church of San Francisco, the most interesting antique in Monterrey, erected in 1590; El Obispado (Old Bishop's Palace), built 1785, from which is obtained a wonderful panorama of the city and surrounding mountains that will long remain in the memory. Near Monterrey are the Garcia Caves and Topo Chico Hot Springs.

## OTHER MEETINGS

Simultaneously with the meeting of the Association in Fort Worth, October 27-30, the following organizations will meet: American Association of School Physicians, International Society of Medical Health Officers, Conference of

State Sanitary Engineers, Texas Association of Sanitarians.

## SPECIAL TRAINS

During July a letter will be sent to the entire membership regarding special train arrangements.

## WESTERN BRANCH, A. P. H. A., MEETS IN SALT LAKE CITY

THAT the Western Branch of the American Public Health Association is a definitely established and functioning organization was affirmed at their first regional meeting held in Salt Lake City, Utah, June 12-14, at which a constitution and by-laws were adopted and many western public health problems considered.

The keynote of the meeting was understanding and appreciation of each other's problems in the field of public health. Making the services and experiences of each part of the western section available to every other part was urged.

Outstanding among the many excellent speeches and papers were the addresses delivered by Governor George H. Dern of Utah, President A. J. Chesley of the A. P. H. A. and President W. C. Hassler of the Western Branch, A. P. H. A.

Governor Dern welcomed the visiting members and emphasized the humanitarian aspects and monetary value of public health work. He said: "It is sometimes puzzling that states or cities should be so reluctant to give adequate financial support to their public health departments. Surely no public expenditure returns larger dividends on the investment."

Dr. Chesley spoke of the importance of interesting the entire world in our problems, and the possibilities that such coöperation offers for a world-wide program. Dr. Hassler pointed out the necessity of awakening a health consciousness on the part of our people. With the support which this would give to the public health program, the amount of work that could be done is inestimable.

About 150 public health workers from western United States, British Columbia, and Hawaii were present at the meeting. Scientific sessions were devoted to the discussion of tuberculosis,

undulant fever, tropical medicine, meningitis, training of health officers, the recent A. P. H. A. survey of Honolulu, school health education, public health nursing and preventive dentistry.

Following discussion on Rocky Mountain Spotted Fever, a permanent committee, under the chairmanship of Dr. W. F. Cogswell, Montana State Health Officer, was appointed. One session was devoted to the public health aspect of the Boulder Dam. This is the first time that consideration has been given to this phase of the Boulder Dam project in public meeting and was followed by the preparation of a resolution requesting the Secretary of the Interior to confer with the Surgeon General regarding the entire problem.

Two evening meetings of interest to the general public were held. These were presided over by Dr. H. P. Kirtley, President, Utah State Medical Society. In discussing "Utah Public Health" Dr. Shepard at the first evening session presented a striking comparison between the practice of 1665 and the present day. Dr. Langley Porter, Dean of the Medical School, University of California, San Francisco, addressed a general session on "Keeping the Family Well." He made a plea for the general practitioner of medicine and approached the question of the cost of medical care from the viewpoint of the physician and the hospital staff rather than from the usual angle of the layman.

Officers elected to carry on the work for the coming year were:

*President*, William C. Hassler, M.D., San Francisco

*First Vice President*, E. H. Hanley, M.D., Seattle

*Second Vice President*, George Parrish, M.D., Los Angeles

*Third Vice President*, T. B. Beatty, M.D., Salt Lake City

*Secretary*, W. P. Shepard, M.D., San Francisco

*Treasurer*, W. F. Higby, San Francisco

Membership in the Western Branch has grown from 125 to almost 1,100 during the past two years, 10 new active members and 26 new regional members being enrolled at this meeting. It is because of this growth that the offices of third vice president and treasurer were created.

#### DR. SLEMONS MICHIGAN'S NEW COMMISSIONER OF HEALTH

C. C. Slemons, M.D., Fellow of the A. P. H. A., for 20 years City Health Officer of Grand Rapids, has been appointed Commissioner of Health of the State of Michigan, to succeed the late Dr. Kiefer. Governor Fred Green could have made no wiser selection from the available persons in the State of Michigan. Dr. Slemons is a graduate of the Detroit College of Medicine and the University of Illinois Medical School. He has been intimately associated with national and state public health work. He has for 11 years been a member of the State Advisory Council on public health. Dr. Slemons served on the Governing Council of the Association from 1921 to 1927.

#### DEATH OF SAMUEL M. HEULINGS

Samuel M. Heulings of Haddonfield, N. J., died at his residence, May 15, at the age of 70.

Mr. Heulings had a long life of useful endeavor devoted to improving and safeguarding public milk supplies. He was a consulting dairy engineer of international reputation and was identified with the development of the first machinery used for the commercial pas-

teurizing and handling of milk in this country.

For a number of years Mr. Heulings manufactured high class dairy equipment at Haddonfield, N. J.; later he was connected with the Sheffield Farms Corporation in New York City and for many years directed the construction and operation of machinery used to process a large portion of the milk supply of New York City. In his work he was always closely associated with municipal health departments and his opinion was highly respected in all matters concerning milk improvement. He has steadfastly advocated the use of the highest standards of safety in pasteurizing milk and has been a ruthless opponent to any and all who have suggested lower standards. As an inventor he has given the dairy industry many useful devices. He is the author of several important contributions to the literature on dairy topics.

During the last few years of his life Mr. Heulings has been consultant to the Lower Merion Township Board of Health on Milk Control matters. At the time of his death he was engaged in the invention and construction of a pasteurizer which he had hoped would enable the processing of milk in a manner far superior to methods used heretofore. Mr. Heulings was a member of the American Society of Mechanical Engineers and a Charter Fellow of the American Public Health Association, elected in 1922, having been a member since 1917. He served for some years on the Committee on Milk Supply of the Sanitary Engineering Section of the A. P. H. A.

#### GERMAN HYGIENE MUSEUM, DRESDEN

THE opening of the new building for the German Hygiene Museum, which has been contemplated since 1911, brings to maturity the plan of presenting in actual or symbolic form, by a series of exhibits, the present-day

knowledge and accomplishments of hygiene, and at the same time shows the widening scope of the Hygiene Museum and its work.

The Museum is also an inspiration center to act as the starting point for a

movement to create opportunities everywhere for permanent instruction in hygiene, thus realizing the ideals of Karl August Lingner, who was a pioneer in exhibition work, and who was responsible to a great extent for the 1911 International Hygiene Exhibition.

With the aid of the German Reich, the Freestate of Saxony, and the City of Dresden, a suitable home has been erected for the Museum on a beautiful central site in Dresden, in the vicinity of the large athletic fields of the Grosser Garten. The foundation stone of the Museum was laid on October 8, 1927, and on May 17, 1930, the new building was dedicated and opened to the public. This also marked the opening of the 1930 International Hygiene Exhibition. For the first time a number of new specimens and groups are shown representing both the latest scientific researches and the development of exhibition technic.

The territory covered by the exposition extends over 120 acres. The center is occupied by the new building constructed by the architect Dr. Wilhelm Kreis. The center of the collections, as in 1911, is the exhibit "The Man" showing the anatomy and physiology of the human body by pictures, models,

preparations, and other devices. Part of this exhibit is the "Transparent Man," a special method of making translucent the tissues of the body, the blood vessels, the skin formation and structure, the respiratory organs—showing lung tissues, etc. Around this are various other groups.

The scientific director of the Museum, Professor Dr. Martin Vogel, is particularly proud of the exhibit which constitutes the department of "Public Health Education." The industrial exhibit also contains many attractive features, while a special exhibit on the "Hospital" has its location in a spacious building covering 1½ acres of ground.

Many countries are represented in the international part of the exhibit.

Ninety-two members of the A. P. H. A. sailed on the S.S. Adriatic from New York on June 14. They will spend about a week in England, and stop at Brussels, Cologne, Wiesbaden and Berlin before reaching Dresden on July 5. Four days will be spent in Dresden. Quite an extended trip will be taken from there—visiting several German cities, viewing the Passion Play at Oberammergau, then going on to Switzerland and France.

## NEW MEMBERS

### *Health Officers Section*

Milton F. Arnholt, M.D., Lincoln, Nebr., Superintendent of Health

Dr. Juan B. Ascanio, Caracas, Venezuela, General Inspector, National Public Health Service (Assoc.)

Atticus G. Blanton, M.D., Sonora, Tex., City and County Health Officer

Lawrence T. Browning, M.D., Kingwood, W. Va., Director, Preston County Health Dept.

Howard L. Darby, D.V.S., Ft. Worth, Tex., Inspector in Charge, U. S. Bureau of Animal Industry Tuberculosis Eradication

Leo P. FitzGerald, M.D., University City, Mo., Health Commissioner

James H. Flynn, M.D., Troy, N. Y., Commissioner of Health

W. H. Ford, M.D., Sudan, Tex., City Health Physician

Joseph P. Franklin, M.D., Cumberland, Md., County and Deputy State Health Officer

Zalmon E. Funk, M.D., Santa Rosa, N. M., Guadalupe County Health Officer

Menno Hostetler, M.D., Wichita, Kans., County Health Officer

Carl C. Irick, M.D., Webster Groves, Mo., Health Commissioner

Marshall T. Knox, M.D., Cleburne, Tex., City Health Officer

S. R. McKelvey, M.D., Denver, Colo., Executive Secretary, State Board of Health

A. R. Matthews, Mule Shoe, Tex., County Health Officer

Louis O. Obrock, M.D., Clayton, Mo., Health Officer, St. Louis County

John B. Setzler, M.D., Columbia, S. C., Director, Richland County Health Unit

Edward H. Trowbridge, M.D., Worcester,

Mass., Chairman, City Board of Health  
 Dr. Jerry E. Vanderpool, Walla Walla, Wash.,  
 Health Officer

#### *Laboratory Section*

O. C. Gerhardt, Houston, Tex., Chemist and  
 Bacteriologist, Phenix Dairy  
 Marshall W. Jennison, S.B., Cambridge, Mass.,  
 Teaching Bacteriology, Massachusetts Insti-  
 tute of Technology  
 Joseph J. Reid, D.V.M., Ft. Worth, Tex., Lab-  
 oratory Director, Livestock Sanitary Com-  
 mission  
 James N. Roche, Ph.D., Pittsburgh, Pa., Re-  
 search Worker, Koppers Company  
 W. S. Stanley, Houston, Tex., Chemist, Sewage  
 Disposal Plants

#### *Vital Statistics Section*

Joseph P. Yaffe, M.D., Boston, Mass., School  
 Physician

#### *Public Health Engineering Section*

John W. Carey, University City, Mo., Super-  
 visor of Sanitation  
 G. C. Carvajol, San Antonio, Tex., Chief Milk  
 Inspector  
 F. E. Devlin, Amarillo, Tex., Consulting Engi-  
 neer, Water and Sewage Purification Prac-  
 tice  
 J. E. Foster, Houston, Tex., Production Man-  
 ager, Phenix Dairy (Assoc.)  
 Fred B. Green, Austin, Tex., Supervisor, Milk  
 Sanitation, State Department of Health  
 Ralph W. Peterson, B.S., Chicago, Ill., Opera-  
 tion of Sewage Treatment Works  
 Elwood J. Umbenhauer, S.B., Laredo, Tex.,  
 Charge of City Water Filtration Plant  
 John B. Waide, Jr., B.S., Sweetwater, Tex.,  
 Sanitary Inspector

#### *Industrial Hygiene Section*

Michael Lake, M.D., New York, N. Y., Medi-  
 cal Director, R. H. Macy & Co.

#### *Food, Drugs and Nutrition Section*

Jessie G. Cole, Albany, N. Y., Nutrition Spe-  
 cialist, State Department of Health  
 Kate Daum, Ph.D., Iowa City, Ia. (Assoc.)  
 Richard C. Graham, B.S., Brownsville, Tex.,  
 Sanitary Inspector  
 Louise L'Engle, A.B., Ames, Ia., Assistant Pro-  
 fessor, Foods and Nutrition, Iowa State Col-  
 lege

#### *Child Hygiene Section*

Maude A. Covalt, R.N., Berkeley, Calif., Pub-  
 lic Health Nurse, Inst. of Child Welfare,  
 University of California  
 Louis Schneider, Salinas, Calif. (Assoc.)  
 Edward F. Urba, M.D., Stamford, Conn.,  
 School Physician  
 M. Rollin Walker, M.D., Reno, Nev., Medical  
 Supervisor of Public Schools

#### *Public Health Education Section*

William C. Fleming, A.B., Augusta, Ga. (As-  
 soc.)

Jessie L. Gilchrist, A.B., Atlantic City, N. J.,  
 Teacher of Hygiene, Senior High School  
 Alexander S. Keenan, M.D., San Francisco,  
 Calif., Deputy Commissioner of Public  
 Health  
 Fletcher B. Morgan, Nashville, Tenn., Associ-  
 ate, Public Health Education, Department  
 of Health  
 Grace C. Patrick, M.D., Kansas City, Mo.,  
 Lecturer on Preventive Medicine (Assoc.)  
 Dr. Alberto Zwanck, Buenos Aires, Arg., Pro-  
 fessor of Hygiene, Medical School, Univer-  
 sity of Buenos Aires (Assoc.)

#### *Public Health Nursing Section*

Grace H. Cole, R.N., Chicago, Ill., Rural Pub-  
 lic Health Nurse, Cook County Bureau of  
 Public Welfare  
 Myrtle E. U. Conquist, R.N., University, Va.,  
 Directing Nurse, Public Health Extension  
 Service  
 Violet Crook, Gonzales, Tex., County Public  
 Health Nurse  
 Emily M. Dannies, Burlington, Ia., County  
 Public Health Nurse  
 Lily C. Jones, B.S., Atlanta, Ga., Territorial  
 Supervisor, Metropolitan Life Insurance  
 Company Nursing Service  
 Ruth H. King, R.N., Cincinnati, O., Territorial  
 Supervisor, Central Territory, Metropolitan  
 Life Insurance Company  
 Mary E. Peace, Ft. Worth, Tex., County  
 Health Nurse  
 Alice A. Rowe, R.N., Greensburg, Pa., School  
 Nurse  
 Elizabeth D. Simon, R.N., Jefferson City, Mo.,  
 Public Health Nurse, Division of Child Hy-  
 giene, State Board of Health  
 Edithe S. Watkins, R.N., Kansas City, Mo.,  
 Assistant Superintendent, Visiting Nurse As-  
 sociation

#### *Unaffiliated*

John R. Dickson, M.D., Chefoo, N. China,  
 Physician, Charge of Chefoo schools for  
 foreign children (Assoc.)  
 Grace G. Farrell, C.P.H., Milton, Mass., Stu-  
 dent (Assoc.)  
 George H. Johnson, Joliet, Ill. (Assoc.)  
 W. E. Stone, D.V.M., Pasadena, Calif. (Assoc.)  
 Chester M. Tobin, Shanghai, China, Physical  
 Director, Foreign Y. M. C. A. (Assoc.)

#### DECEASED MEMBERS

Samuel M. Heulings, Haddonfield, N. J.,  
 Elected Member 1917, Fellow 1922  
 Guy L. Kiefer, M.D., Lansing, Mich., Elected  
 Member 1907, Fellow 1923  
 Woods Hutchinson, M.D., Hollywood, Calif.,  
 Elected Member 1912  
 S. S. Winner, M.D., Denison, Ia., Elected  
 Member 1919

# PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Providence, R. I., Survey—The attention of the public health worker has for a long time been focused upon Providence, R. I., because of the unusual piece of health work being carried on there under the direction of Charles V. Chapin, M.D. Therefore, it is particularly interesting that a health and hospital survey has been made. The survey was carried on by James Wallace, M.D., under the auspices of the Committee on Administrative Practice of the A. P. H. A. A report of 314 pages has been published in which are set forth many of the remarkable contributions to public health made by Providence through Dr. Chapin, and Edwin M. Snow, M.D., his predecessor.

This city has been credited with being a pioneer in several fields of public health administration, largely due to the commanding influence of Dr. Chapin, who has been the Superintendent of Health for 46 years. In fact, since the organization of the Department of Health in 1856 there have been only two health officers in Providence, Dr. Snow having served for 28 years.

... These records are remarkable for the two physicians in that they were able to give such long continuous service, and remarkable for the city that there has been so little political interference with the office, and that it has been fortunate in having administrative officers who have been spared to it and remained with it in all the changing conditions incident to three-quarters of a century of a city's life.

Providence was the first city in this country to establish, in 1888, a municipal public health laboratory. In 1893 the first experiments in filtering water by municipal filtration were made here. Providence was the first city to discontinue, in 1905, fumigation as a form of

terminal disinfection. This city was one of the first in the United States to make vaccination against smallpox a qualification for school enrollment. It has been a requirement for school attendance since the year 1856. It is stated that Providence was the first city in the country to establish, in 1908, an open air school for children needing education under special protective conditions.

Based on the *Appraisal Form for City Health Work* (3d ed.), of a possible 1,000 points Providence attained a score of 817.2. There is a general uniformity of high attainment in all of the recognized activities, no one of which scores less than 50 per cent. With the exception of preschool hygiene, food and milk control, public health instruction, cancer and heart disease, all of the activities rated 80 per cent or better. The staff of the Department of Health consists of 61 persons, 34 of whom are full-time and 27 part-time. In addition to the Superintendent of Health there are 2 deputy superintendents, 16 nurses, 5 inspectors, 2 technicians, 7 clerks, 1 automobile driver; and a part-time personnel consisting of 12 clinic physicians, 7 physicians for sick poor and private schools, 2 dentists, 1 technician and 3 clerks. There is no division of venereal disease control, this work being carried on by the State Department of Health. The City Department of Health with its 16 nurses performs only a part of the public health nursing work, as this work is supported by the District Nursing Association employing 72 nurses and the public school staff of 18 nurses. There is no division of the department dealing with tuberculosis. This is partly a state

function and partly a function of a voluntary agency, the Providence Tuberculosis League.

Among the general recommendations made by the Survey Committee is one for better financial support of the City Department of Health. Despite a low per capita appropriation for health, Providence has done a splendid job in health conservation. Another recommendation was that a properly planned program of popular health instruction be inaugurated. To the epidemiologist the details of the control practices as performed in Providence should be of special interest. It is not the general practice passively to immunize by giving diphtheria antitoxin to all susceptible household contacts. These are kept under observation and if they give any indication of developing diphtheria they are given a full therapeutic dose.—James Wallace, M.D., *A Survey and Appraisal of the Health Activities of Providence, 1929*. Published by Providence Community Fund.

**Municipal Expenditures for Public Health**—Using the tabulations prepared for *Public Health Bulletin No. 164* giving the official expenditures for the various divisions of public health procedure, an endeavor has been made to ascertain any possible correlation between a reduction of infant mortality in large American cities and amounts of money expended by official agencies for various health functions. As there exists no uniformity of bookkeeping for health departments it is extremely difficult to make comparisons by function.

Under these limitations there cannot be shown statistically any direct relation between the per capita expenditures and infant mortality rates, on the basis of geographical correlation for a single year. The desirability of a study using reliable figures for a series of years immediately suggests itself. Thus we might ascertain whether increasing per capita expenditures for various health services has a definite effect upon the general trend of infant mortality.—Richard A. Bolt, *Municipal Expenditures for Public Health, J. Hyg., 11, 601* (May), 1930.

**Rural Health Service**—At the beginning of the present calendar year there were 505 counties or districts with local health service under whole-time health officers. Eighty-eight per cent of these were receiving aid from the state health department, U. S. Public Health Service, or the Rockefeller Foundation. During 1929, whole-time health service for counties was established in 47 units and was discontinued in 9. The largest gain in one state was that of 15 in Tennessee. For per cent of rural population served, Alabama leads with 80 followed by Maryland, Ohio, South Carolina, Louisiana, and North Carolina, each exceeding 50 per cent. The rural population of the United States in 1920 was 51,406,017 of which 24 per cent is now served with whole-time health departments.—L. L. Lumsden, *Extent of Rural Health Service in the United States, 1926-1930, Pub. Health Rep., 45, 1065* (May 9), 1930.

# LABORATORY

C. C. YOUNG, D. P. H.

## DESCRIPTION OF A NEW MECHANICAL DISINTEGRATOR

E. W. SCHULTZ, M. D., F. A. P. H. A., AND F. D. BANHAM

*Stanford University, Calif.*

INVESTIGATORS working with filtrable viruses appreciate how much time may be consumed in reducing virus tissues to a finely divided physical state, a task generally carried out by hand with the aid of a mortar and pestle. This method of grinding tissues is not only comparatively inefficient, but exceedingly monotonous and tiring. In order to overcome these objections, we designed a machine whereby the mortar and pestle could be operated mechanically. This has proved so satisfactory that we offer a brief description of it for the benefit of those interested.

Figure I gives a top and Figure II a lateral view of the machine. The machine proper is fastened to a metal base (1). It consists of a suitable cast iron pedestal (2), provided with a thrust bearing (7), into which is fitted a shaft (6), which passes through into the

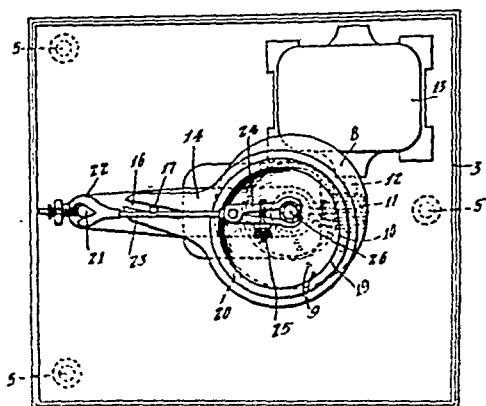


FIGURE I

grinding chamber and bears at its upper end a driving disc (8) provided with

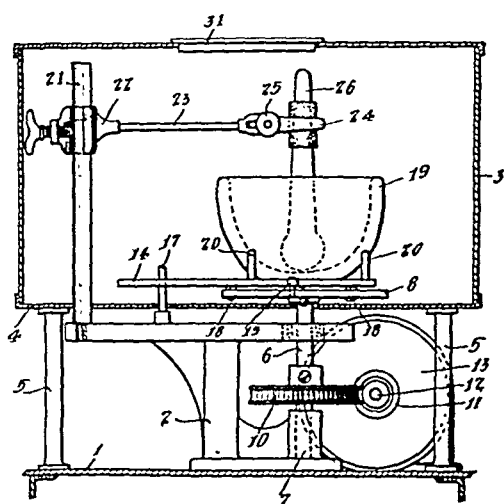


FIGURE II

several eccentrically placed apertures (9). The shaft is driven by means of worm gear (10), which engages with a worm (11), attached to the horizontal shaft (12) of an electric motor (13).

Within the grinding chamber a platen (14) is movably positioned above disc (8) by means of a pin (15) which fits into one of the eccentric apertures (9). The platen (14) is provided with a bifurcated end (16), which engages with a fixed pin (17) attached to the pedestal (2). The mortar may be fixed in position on the platen by means of rubber covered metal fingers extending upward from the platen (14).

The pestle (26) is held in position by



means of a round flexible metal arm (23) provided with a clamp (24), operated with a thumb screw (25). The metal arm (23) is fastened by means of a special clamp (22) to a vertical triangular rod (21) fixed to the pedestal (2).

The mechanism described imparts to the platen holding the mortar an eccentric motion. By thus moving the mortar the pestle is brought into essentially the same operable relationship with the mortar as when the grinding process is carried out by hand. When desirable,

grinding may be carried on in a closed chamber (3), which may be entered by means of a hinged lid, provided with a glass window to facilitate inspection of the material while the machine is in operation.

The machine described should not only prove useful in grinding virus tissues, but also in grinding most substances that are commonly disintegrated by means of a mortar and pestle.

The device has been patented and arrangements are being completed for its manufacture.

## ELECTRIC KJELDAHL NITROGEN WITHOUT FUME HOOD

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PH. D., F. A. P. H. A.

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**A**N electric Kjeldahl nitrogen apparatus is herein described which is very convenient and satisfactory. We have used it for nearly two years and are able to make nitrogen determinations on various kinds of waters, sewage, effluents and trade wastes accurately and rapidly.

The general arrangement of the apparatus is shown in Figure I.

The still and digester were designed and constructed at the Service Department of the University of Wisconsin. The structural frame work was built in the form of brackets from 1" x 1/8" angle iron welded together, which were then securely fastened to the wall by means of bolts. These brackets were designed to receive and hold securely the various parts of the two pieces of apparatus. The switch box supports were made from a length of heavy galvanized sheeting shaped to fit the switches and form an integral part of the brackets.

tops are employed for heating the flasks in each piece of equipment. These were set in place on an angle iron shelf which is a part of the bracket. Each heating unit requires 0.6 K.W.H. of current. Four service leads from a service switch box were installed, each carrying 30 amperes of 110 volt alternating current. Each heating unit is controlled by an ordinary snap switch. The advantages of electric heating are even temperature, low fire hazard, and ease of operation and maintenance.

The distillation apparatus is provided with an automatic signal which rings a buzzer when the proper quantity of distillate is received in the flasks. To accomplish this the extreme right hand flask, Figure I, is counter balanced so that a given weight of distillate will make electric contact and ring the buzzer. The distillation rate is so constant that all flasks are filled at the same rate as the signal flask. Aside from the safety factor the analyst has no watching to do while distillation is in progress and is free to do other tests.

### ELECTRIC EQUIPMENT

Gilmer heating units with hollowed

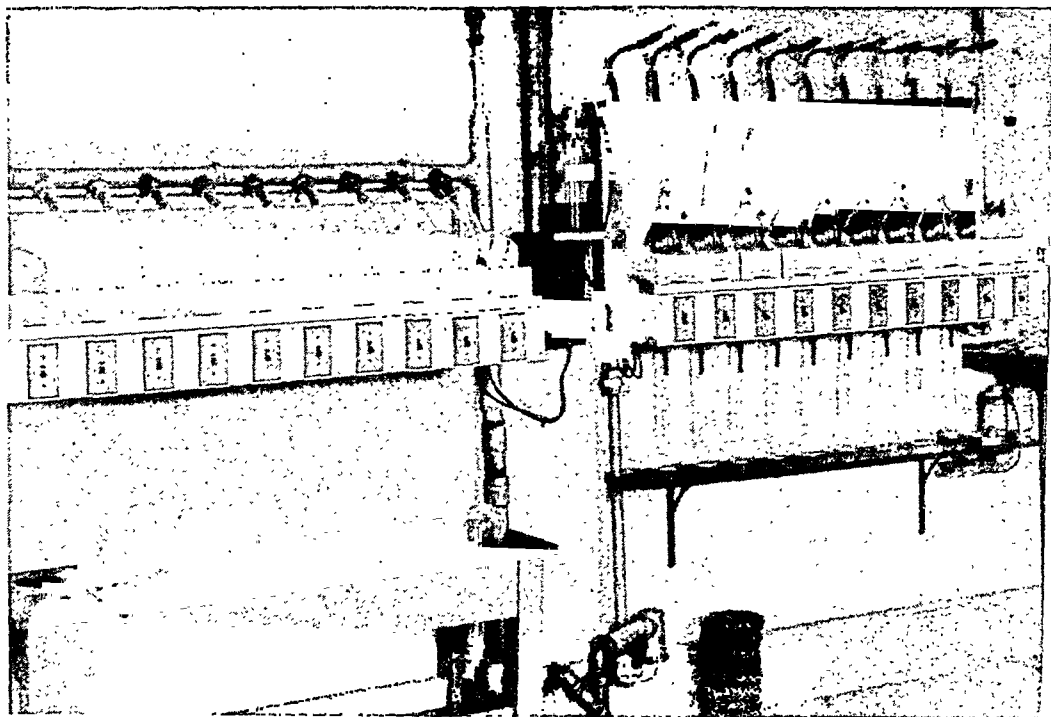


FIGURE I

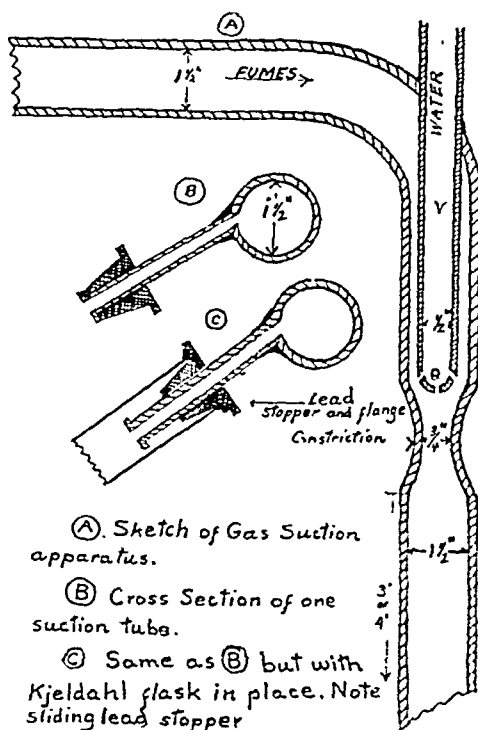
#### THE STILL CONDENSER

The condenser was made from heavy copper sheeting in the form of a rectangular box open at the top—50" long, 24" high and 3" wide. The condenser tubes were made of block tin 7/16" outside diameter, with 1/16" wall, each 36" long extending below the tank for receiver flask connection and above tank for flask connection. They were soldered in the bottom of the tank and supported by cross arm at the top. Each tube at bend for flask connection was surrounded by a steel spring to prevent sharp bends. The copper tank was reinforced in the central part to prevent bulging. Water is connected for cooling to the bottom of one end, with a waste pipe connected with sewer at the top of the other end.

#### THE FUME ELIMINATOR

The fume suction tube is modelled after one described by Hastings, Fred, and Peterson (1927)<sup>1</sup> but with some modifications which we believe to be im-

provements. The main suction tube is of 1½" lead pipe of approximately ¼"



(A) Sketch of Gas Suction apparatus.

(B) Cross Section of one suction tube.

(C) Same as (B) but with Kjeldahl flask in place. Note sliding lead stopper

FIGURE II

wall. The essential parts of this apparatus are shown in Figure II. The construction immediately under the water jet permits the trapping of air and fumes as the water emerges from the slanting orifices. The flask connections are wiped into holes made in the main lead pipe. These side branches are of  $\frac{3}{8}$ " lead pipe with  $\frac{3}{16}$ " wall and are fitted with a sliding lead stopper as shown in (B), Figure II. In (C), Fig-

ure II, the flask is shown in place with the flange of the stopper resting on the lip of the flask. It is necessary that the flange of the stopper fit rather closely but the slight variation in the size of the neck of standard Pyrex flasks has offered no difficulty with our apparatus.

#### REFERENCE

1. Hastings, Fred, and Peterson. *J. Ind. & Eng. Chem.*, 19: 397, 1927.

## VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

**Vital Statistics for England and Wales, 1929**—The Registrar General's report of vital statistics for 1929 gave a birth rate of 16.3 per 1,000 population and a death rate of 13.4 per 1,000 population. Communicable disease death rates per 1,000 population were: diphtheria, 0.08; measles, 0.74; typhoid fever, 0.01; and whooping cough, 0.15. The birth rate for London was 15.7 and the death rate 13.8 but these rates were for civilians only.—*Pub. Health Rep.*, 45: 754 (Apr. 4), 1930.

**Vital Statistics for Scotland, 1929**—The Registrar General of Scotland reported the number of deaths registered in 1929 as 70,917, giving a rate of 14.5 per 1,000 population. There were 92,876 births, a rate of 19.0 per 1,000 population. Marriages numbered 32,992 and deaths under 1 year, 8,058.—*Pub. Health Rep.*, 45: 755 (Apr. 4), 1930.

**Vital Statistics for Irish Free State, 1929**—The estimated population of the Irish Free State in 1929 was 2,971,992. There were 58,342 births, giving a birth rate of 19.8 per 1,000 population; and 42,974 deaths, a mortality of 14.6. Deaths from principal

causes of death were: cancer, 3,016; pulmonary tuberculosis, 3,034; influenza, 1,629; diphtheria, 292; measles, 134; scarlet fever, 60; typhoid fever, 78; whooping cough, 378; and violence, 924.—*Pub. Health Rep.*, 45: 755 (Apr. 4), 1930.

**Age-Sex-Seasonal Incidence of Certain Diseases in Children**—The records of nearly 2,500 patients from birth to 13 years of age who were admitted to the Hospital for Sick Children during the past 5 years and about 5,000 records obtained from the Toronto Department of Public Health were examined to determine the age, sex, and seasonal incidence in various diseases. A pronounced age incidence was observed in certain diseases. Thus, of 351 cases of endocarditis only 7 were in patients less than 4 years of age; of 108 patients with rheumatic fever, only 1 was less than 3 years of age. Almost 70 per cent of the 48 infants with scurvy were from 6 to 12 months old and only 2 were more than 2 years old. The youngest patient with tetany was 8 weeks old and over 75 per cent of the patients were from 4 to 12 months old. The age incidence of intussusception approximated

that of tetany in that 79 per cent of the patients were also from 4 to 12 months of age. In hemorrhagic disease of newborn infants, the latest time of onset was after the 10th day. There were only 21 patients with acrodynia and the age of the patients varied from 8 to 23 months.

In the majority of diseases considered, it was found that males constituted no less than 60 per cent of the total patients were affected. In the cases of pyloric stenosis, 82 per cent of the patients were males and in tetany male patients accounted for 68 per cent of the total. Pyelitis and primary peritonitis occurred predominantly in females, no less than 80 per cent of the patients with pyelitis and 75 per cent of the patients with primary peritonitis being females. Endocarditis, chorea, whooping cough, and typhoid were the only other diseases seen more frequently in females than in males.

Tetany and anterior poliomyelitis showed marked seasonal incidence. Retropharyngeal abscess, nephritis, erysipelas, primary peritonitis, and acute appendicitis occurred somewhat more frequently during the winter and spring months. Pyelitis, intussusception and pyloric stenosis, on the other hand, were noted more frequently during the summer. A slight but definite seasonal predominance was found with hemorrhagic diseases of the new-born, purpura, chicken pox, scarlet fever, measles and asthma.—F. F. Tisdall, *et al.*, *Am. J. Dis. Child.*, 39: 163–173 (Jan.), 1930.

**The Homicide Record for 1929—**The United States has the highest homicide death rate of any large country in the world. In 1900, the homicide death rate of 31 American cities with comparable returns was 5.1 per 100,000 population; in 1919, the rate reached 9.1; and 10 years later, in 1929, the rate was 10.1.

A detailed record for 141 American

cities for 1929, with a total population of about 38,000,000, showed 3,993 deaths from homicide, or a rate of 10.5 per 100,000. Memphis, Tenn., Birmingham, Ala., and Atlanta, Ga., showed the highest homicide rates for 1929, 66.8, 51.3 and 51.0 respectively. All of these cities have a relatively large colored population among which the homicide rate is persistently higher than among whites. The proportion of homicide deaths by firearms was 74.2 in New Orleans, 72.6 in Birmingham and 76.8 in Memphis compared to 48 per cent in Boston. The economic aspects of the homicide record are emphasized in the average age at death of the victims; for Memphis, 1924–1928, 31.7 years; Birmingham, 1927–1929, 31.6 years; New Orleans, 1920–1926, 31.3 years, and Boston, 1920–1929, 31.6 years.

The homicide rate for 13 leading cities of Canada for the period 1918 to 1928 decreased from 2.7 per 100,000 at the beginning of the period to 1.7 at the end. For 1928, the homicide death rate of Edmonton was 2.6 per 100,000; Montreal, 1.4; Ottawa, 0.18; Saskatoon, 2.8; Toronto, 2.7; Vancouver, 2.3; Windsor, 3.8, and Winnipeg, 2.5. Brantford, Calgary, Hamilton, London and Victoria had no homicides. The number of homicide deaths in the entire Dominion was 124, which, on the basis of 9,240,000 population, gives a rate of 1.3 per 100,000. For England and Wales for 1928, the homicide death rate was only 0.5 per 100,000, or precisely the same as 10 years ago. For the U.S. Registration Area for 1927, the homicide death rate was 8.7 and for 1928, 8.8.

The enforcement of prohibition has brought into existence an organization of crime and criminals. Constant attention has been directed toward Chicago as the center of organized crime, yet the homicide death rate for Chicago for 1929 was 12.7 per 100,000 or not

much above the average for the country at large. New York City had a rate of 7.1 per 100,000 or decidedly below the average of the whole country. Philadelphia had a rate of 8.8 in 1928, declining to 8.4 in 1929, or both years below the average. The rate for Detroit increased from 16.5 to 18.6. This is in marked contrast to the low rate for Windsor, Canada, which in 1928 was only 3.8, although the city is right across the river from Detroit.—Frederick L. Hoffman, *Spectator*, 124: 3, 18–19, 21 (Mar. 20), 1930.

**Insured of Metropolitan Life Insurance Company**—Never before during the first quarter of any year have health conditions been as good as have prevailed during the winter months of 1930. This is clearly shown by the mortality experience of approximately 19,000,000 persons who are insured in the industrial department of the Metropolitan Life Insurance Company. Comparison with the figures for the like period of 1929 shows marked reductions, for both white and colored policy holders, in the death rates for practically all of the important causes of death. Some improvement was expected, it is true, as there has been no wide prevalence this year of any of the epidemic diseases, whereas last year's first quarter health conditions were the worst experienced during the entire decade, owing to the epidemic of influenza which reached its height late in January, 1929.

The outstanding item again this year is the reduction in the death rate for tuberculosis. At the end of the first quarter, the death rate among white policy holders was only 65.3 per 100,000, a reduction of 10.3 per cent from the lowest figure that had previously

been recorded in the corresponding period. Among the colored, the death rate was 207.8, marking a drop of 4.6 per cent from the lowest previous figure.

With the exception of scarlet fever, all of the principal epidemic diseases of childhood have shown reduced mortality as compared with the winters of both 1929 and 1928. The most noteworthy drop is that for diphtheria. All indications point to a new minimum death rate for this disease this year.

An encouraging item is a pronounced drop in the death rate among white persons for cancer. If this persists (which is by no means assured), 1930 will be the first year since 1924 to show any interruption in the steadily rising mortality from malignant growths.

The largest decreases in the death rate, as compared with the early part of last year, have been those for influenza and pneumonia; but there have also been more or less marked declines for diabetes, cardiac diseases, diarrheal complaints, chronic nephritis, and puerperal conditions. Deaths from alcoholism dropped from 175, in the first quarter of 1929, to 155 in the like period of the current year; and the death rate declined from 3.8 per 100,000 to 3.3, a decrease of 13.2 per cent.

Suicides and homicides have been a little more frequent than in the early months of last year. The death rate for accidents, as a group, is practically unchanged. Automobile fatalities, on the other hand, have gone on increasing among both white and colored policy holders. Unless marked improvement takes place later in the year the death rate for this cause will be considerably in excess of the previous maximum, recorded only last year.—*Stat. Bull., Met. Life Ins. Co.*, 11: 1–4 (Apr.), 1930.

# PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

**Bacteria of the Coli Group in the Intestines of Birds and Their Importance in the Fecal Pollution of Water**—The author examined 74 birds of four groups—domestic land birds, domestic water birds, wild land birds, and wild water fowl. In 37 birds coli bacteria were detected. There were 46 strains which fermented lactose; 3 of these were not indol-forming; there were also 7 para-coli strains which were not lactose-fermenters. The absence of coli bacteria in the intestines of birds or fish can be traced to the purity of their environment and nourishment. No coli bacteria were found in the water of a mountain lake inhabited by ducks and snipe, but a passing flock of ducks polluted a pure water reservoir in Los Angeles with coli bacteria. Of the 46 strains of coli-like bacteria cultivated by the author, 78 per cent were fecal, 22 per cent showed signs of transition to *B. aerogenes*, and only 2 per cent were *B. aerogenes*. The conclusion is reached that *B. coli* is not necessarily present in the intestines of birds, but is present when conditions of life or nourishment bring birds in contact with men or animals. The possibility of the pollution of pure water by wild birds must therefore not be disregarded.—Minkewitsch, *Ztschr. f. Hyg. u. Infektionskrankh.*, 110: 506, 1929; *Tech. Gemeindebl.*, 33: 20, 1930. (From Papers of Water Pollution Research Board, England.)

**Successive Separation in Sewage Disposal Systems**—The author deals with the development and operation of various forms of sewage disposal apparatus. The composition of the average sewage which the various forms of

apparatus are designed to render stable, inoffensive and harmless is given. Two successive separations, screening and settling, are present in almost every form of apparatus.

The development of designs of tank treatment along three distinct lines of thought is fully discussed. These lines are (1) the liquefaction of the greatest possible amount of solid and its mechanical separation in single storied tanks primarily designed for maximum liquefaction; (2) the mechanical separation of as much solid as possible in two storied tanks with maximum liquefaction of the separated solids in the lower tank; (3) the maximum separation of solids in plain sedimentation tanks without any deliberate intention of liquefaction.

The first is a development of Cameron's septic tank, and has been rigorously followed in India. The second is exemplified in the Imhoff or Emscher and Travis hydrolytic tanks. The third is developed to an advanced stage at Birmingham. The essential features of all the processes are given, together with charts showing chains of successive separations in the ordinary Imhoff, single Travis, Birmingham, septic tank and filter, Croydon and Ideal Systems. The reduction of the size of the lower chambers with corner settling pockets is advised.

The author sketches the ideal installation based on the successive separation of solids from liquids and removal at each stage as fast as they are separated. The system consists of screening, grit catching, preliminary settling of sludge, sludge digestion, preliminary bio-aeration treatment, final settlement and

sludge drying. The ideal plant contains ten separations, eight of which are successive in one chain, and two in another.—F. C. Temple, *J. Inst. Munic. Co., Eng., Lond.*, 56: 549, 1929. (From Papers of Water Pollution Research Board, England.)

**Activated Sludge Process for Sewage Disposal**—This is a report of a paper delivered at a meeting of the Liverpool Section of the Society of Chemical Industry. It had been established by investigation that colloids in sewage, when free from the effect of electrolytes, had an iso-electric point at a pH of 4.6; below this they were electro-positive and above it electro-negative. Electrolytes moved the iso-electric point toward greater pH. In ordinary sewage with a pH of 7.4 the colloids were electro-negative.

The mechanism of the activated sludge process was discussed and it was suggested that the intense bacterial activity so enhanced the electro-negative charge on the sludge that by virtue of the great difference in the charge it acted on the colloids as an electro-negative suspension would on electro-positive colloids.

It was suggested that greater efficiency might be gained for the process by maintaining the sewage at a pH of about 5.8 during the treatment, as the colloids would then be electro-positive and the velocity of coagulation would be increased. A method of preparing activated sludge for starting up a new plant is suggested.—E. C. C. Baly, *Chem. Age*, 1930, 22, 78. (From Papers of Water Pollution Research Board, England.)

**Power Gas from Sewage Sludge**—The crude sludge from the Birmingham, Tame, and Rea District Drainage Board Works is pumped to the primary digestion tanks at the Saltley works where it is retained for 3 months and

then pumped to the secondary digestion tanks and thence after 2 months' retention to drying beds. A gas composed of 67 per cent methane, 30 per cent carbon dioxide and 3 per cent nitrogen, and having a calorific value of about 625 B.T.U. per cu. ft., is produced. Sludge gas drives a 34 h.p. gas engine at the Colehall works. The results of an investigation made at this plant to determine what amount of power might be expected from the sludge available at the Saltley works are tabulated. A vertical gas engine, alternator and floating gas collectors were consequently installed at Saltley.

Details are given of the floating gas collectors, which consist of reinforced concrete rafts with vertical sides and pyramids through which the gas is drawn. The estimated total available output is 10 million h.p. hours per annum, which is about five times the Board's present requirement.—Anon., *Canad. Eng.*, 57: 816, 1929. (From Papers of Water Pollution Research Board, England.)

**Studies on Yellow Fever in South America. Transmission Experiments with *Aedes Aegypti***—Batches of *Aedes aegypti* which had fed on monkeys in the early febrile stage of yellow fever and subsequently passed the accepted incubation period failed to transmit the disease to normal monkeys in 50 per cent of the experiments. Over 80 per cent of blood transfers during this same period were successful.

Monkeys failing to show fever following mosquito bites later proved resistant to blood or tissue inoculations containing virus.

From these experiments arises the possibility of a natural development of immunity in man where ill defined cases of yellow fever exist.—Nelson C. Davis and Raymond C. Shannon, *J. Exper. Med.*, 50, 6: 793–801 (Dec. 1), 1929. Abstr. H. A. Johnson.

**Studies on Yellow Fever in South America. Transmission Experiments with Certain Species of Culex and Aedes**—Experiments were made to determine the possibility of transmission of yellow fever to monkeys both by the bites and by injection of ground-up mosquitoes of the species *C. fatigans*, *Aedes scapularis*, *Aedes serratus*, and *Aedes taeniorhynchus*.

*Aedes scapularis* was the only species found capable of transmitting the virus by bite. Injection of ground-up *Aedes serratus* and *Aedes taeniorhynchus* seemed to produce light attacks of yellow fever in the monkeys. There was no evidence that the disease could be transmitted by *C. fatigans* in either manner, although monkeys bitten by this species appeared to have acquired a relative immunity to the disease.—Nelson C. Davis and Raymond C. Shannon, *J. Exper. Med.*, 50, 6: 803–808 (Dec. 1), 1929. Abstr. H. A. Johnson.

**Enumeration of the Anaerobic Sulphite Reducing Bacteria and the Significance of Their Presence in Water**—The writer gives a very able discussion of this subject and in his summary reduces the results of his work to a small space. He concludes that anaerobic sulphite reducing bacteria, both obligatory and facultative, are numerous in feces of man, less numerous in the excreta of the horse and cow, and of varying extent in that of gulls; in feces sulphite reducers are more numerous in the vegetative states than as spores; the presence of these organisms

in water indicates objectionable contamination and that the preponderance of vegetative forms shows such contamination to be recent. Vegetative forms of sulphite reducers were more resistant to unnatural conditions, including the presence of chlorine, than *B. coli*.

There is now no certainty that all sulphite reducers are non-pathogenic, but since they are likely to be of objectionable origin their presence in drinking water is to be deprecated.—B. A. Adams, *Water and Water Eng.*, 31, 369: 412–415 (Sept. 20), 1929.

**A Study of the Possibilities of Transmitting Yellow Fever by Means of Stegomyia Excreta**—(Title briefed.) Inoculation of *Macacus rhesus* with excreta of infected *Aedes aegypti* with consequent production of yellow fever definitely showed that yellow fever virus is present in excreta of infected aedes.

From 5 to 7 days following a blood meal on infected monkeys, yellow fever virus was found in aedes excreta. Male aedes placed with infected females were found 12 days later to have acquired yellow fever virus. Female aedes left in contact with infected males for 17 days acquired the infection as shown by inoculating monkeys.

The above results show the possibility of spreading yellow fever virus among mosquitoes without a blood meal or human host.—H. de Beaurepaire Aragao and A. da Costa Lima, *Trop. Dis. Bull.*, 26, 12: 1001 (Dec.), 1929. Abstr. H. A. Johnson.



# INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

**Toxicity of Dichloro-Difluoro Methane: A New Refrigerant**—The contemplated use of the substance named in the title for domestic and commercial refrigeration and in air conditioning public buildings and possibly homes, has caused the Experiment Station to investigate the possible health hazards of the new product. The present is a brief report giving the results of studies on animals exposed for 7 to 8 hours daily for a period of approximately 12 weeks to breathing 20 per cent by volume of the vapors of the substance in air. This percentage was chosen because it had been found to produce distinct symptoms at this concentration although no indication of acute poisoning; also, such percentage represents an abnormally high value from the viewpoint of contamination of air by gases and vapors, but not high enough to reduce the oxygen content to an asphyxiating degree.

A description of the apparatus used with an accompanying diagram and tables showing the results of tests, accompany the article.

Dogs, monkeys, and guinea pigs were used in the prolonged experiment above mentioned. Dichloro-difluoro methane was found to produce mild to moderate tremor in dogs and monkeys with a gait resembling alcoholic ataxia but not unconsciousness. A tolerance was developed, as manifested by a decrease in symptoms. Guinea pigs showed no significant symptoms. Weight, blood test, autopsy findings, and pregnancy were not materially affected. No fatalities occurred among the dogs and monkeys. Those few which occurred among guinea pigs apparently had no relation to exposure.

The investigation has shown that at least 20 per cent dichloro-difluoro methane vapor can be repeatedly withstood for 7 to 8 hours daily, with but an occurrence of temporary symptoms and without signs of cumulative or permanent deleterious effects. The compound is therefore placed in the class of practically non-toxic gases (a table of toxic gases is given on an accompanying page).—R. R. Sayers, W. P. Yant, John Chornyak, and H. W. Shoaf, U. S. Bureau of Mines, *R. I. 3013*, May, 1930, 14 pp.

**Warning Agents for Methyl Chloride in Refrigeration Systems**—A research was made to find a warning agent for admixture with methyl chloride so powerful that if a leak should occur from a methyl chloride refrigerating machine, those present would receive an unmistakable warning before dangerous concentrations of methyl chloride and warning agent in the air were reached. The requirements, factors opposing and favoring irritants and odorants, the sizes of leaks which agents must warn against, are all considered.

The principal content of the bulletin summarizes the experimental data secured from testing a large number of substances with the general conclusion or unanimous opinion of the chemists who were connected with the problem that although several substances are very good warning agents in some respects, each has some objectionable properties. At present acrolein appears to be the best, but among other good agents are sulphur dioxide, allyl alcohol, butyl mercaptan, ethyl mercaptan, dimethyl sulphide, and chloropicrin. Preliminary tests also showed that a consid-

erable number of substances (named) were rejected for one reason or another.—The Roessler & Hasslacher Chemical Co., Niagara Falls, N. Y., Mar. 1, 1930, 31 pp.

### Observations on the Possibility of Methyl Chloride Poisoning by Ingestion with Food and Water—Summary as follows:

1. No apparent signs of poisoning were caused by the average daily ingestion on 4 consecutive days of 550 gm. of ground raw beef or 200 c.c. of milk that had been exposed 15 to 75 hours to 100 per cent methyl-chloride vapor at 35° F.

2. No apparent symptoms of poisoning or changes in the hemoglobin and blood cells were caused by the ingestion of methyl-chloride contaminated water on 115 days of a total period of 171 test days. Also, no formates were found in the urine. Autopsy and examination of frozen sections, however, revealed a moderate degree of intracellular fatty degeneration affecting the ascending, descending, and collecting tubules of the kidney. Analysis showed the water to be 75 to 100 per cent saturated with an average methyl-chloride content of 0.595 gm. per 100 c.c. of water. This was the only water given the animals on 6 days of each week of the test.

3. The taste of water saturated with methyl chloride at 68° F. is sharp, sweetish, and sickening when first taken into the mouth, followed almost immediately by a burning sensation. Persons would not drink more than a mouthful or two. It was frequently refused by the animals, even though they were deprived of other water.

—W. P. Yant, H. W. Shoaf, and J. Chornyak (U. S. Bur. of Mines), *Pub. Health Rep.*, 45, 19: 1057–1065 (May 9), 1930.

**Titanium Oxide Pigments**—The article is principally a description of the technical processes involved in the manufacturing of titanium oxide and the associated bodies, and 15 of its applications in commerce—of chief concern being a pigment to replace lead in paints.

Titanium oxide has now become established as one of the staple pigments of commerce. It possesses a high refractive index and remarkable opacity

and can be produced at a minimum cost while the supply is practically inexhaustible. In a comparison as to whiteness, standard titanium white stands at 390 points, a mixture of titanium white and barium sulphate in the same proportion at 290 points, where white lead stands at 100 points.

Recently, a composite pigment for commercial use has been prepared with a content of 50 per cent titanium oxide. This pigment has a specific gravity which is considerably lower than that of lead, so that a given weight of material spreads over a larger area; at the same time its obliterating power is remarkable. It may be combined with cement and is the only white pigment which combines great opacity with resistance to heat and chemical action. Furthermore, it is not attacked by sulphur dioxide or other sulphur gases, so that it retains its whiteness in the most impure city atmosphere. Finally it is entirely free of any poisonous or harmful properties.

Extensive experiments with rabbits and guinea pigs and even human experiments in ingesting the substance have fully substantiated its harmlessness. It may therefore be combined even in face powders and cosmetics.

In conclusion, the new pigment is not put forward as a substitute for others, it is peculiarly useful as a pigment and has a vast field of usefulness in many industries. Colored pigments may also be easily combined with it.—Noel Heaton, *J. Chem. & Indust.*, 49, 11: 143–150 (Mar. 14), 1930.

**Causes of Death by Occupation**—The first monograph "Causes of Death by Occupation" appeared some years ago known as *Bulletin No. 207* of the Bureau of Labor Statistics and analyzed the causes of death (among the 2,000,000 then insured) of 94,269 white males 15 years of age and older who died during the 3 years 1911 to 1913. Today

workers 20 years of age may expect to live, on the average, 5 years longer than similar workers could in 1912.

Tuberculosis has always been the predominating scourge of the American workman; but since 1912 tuberculosis of the respiratory system alone has declined over 50 per cent. Only a few conditions, like cancer, have shown a rising death rate.

The present bulletin is based upon experience with 3,250,000 white male policy holders. Of these 112,364 died during the years 1922, 1923, and 1924. As the number of insured persons in each occupation is not known the authors have used the method of proportionate mortality, the utility of which is now granted. The occupations have been classified according to the *Classified Index of Occupations* of the U. S. Bureau of Census. It is noted that after age 25 the mortality rate of the insured group increases above that of males in the registration states, which is considered largely the result of industrial hazards of one kind or another. A contrast is seen between sexes which is thought to be due largely to the absence of industrial hazard in the lives of most women.

The main part of the bulletin is taken up with an analysis of the mortality according to the occupation of some 33 commoner trades and callings followed by a chapter on the principal causes of death among the group considered. Regarding occupational diseases it is said: ". . . and yet a careful study of the experience leaves no doubt that in spite of the special precautions to discover these diseases, by far the larger number of them remain undetected." The great majority of the 321 deaths attributable to occupational diseases were caused by pneumoconiosis (including miners' asthma) and lead poisoning.

A positive association between employment and affliction is more clearly marked in the case of accidental vio-

lence, tuberculosis, the nontuberculous respiratory diseases, alcoholism, and such a strictly occupational disease, for example, as lead poisoning. Typhoid fever is generally prevalent among workers where the water supply is questionable. In regard to cancer, heart disease, and other degenerative diseases, however, the results do not ordinarily reveal a connection with any industrial hazard.

The absence of trustworthy occupational mortality statistics in the United States hinders the work of industrial hygienists, and an investigation such as this one can only partially overcome the lack of reliable data that now exists. "It is therefore strongly urged that the U. S. Bureau of the Census compile and tabulate data showing the mortality of workers engaged in different occupations. The reports of the Registrar General of England and Wales give much more complete information on occupational mortality than is available in this country.—Louis I. Dublin and Robert J. Vane, Jr., *Bull., U. S. Dept. of Labor, No. 507*: 1-128 (Feb.), 1930.

**An Experimental Study of Abnormalities Produced in the Organism by Electricity**—This work was done in the Departments of Neurology and Electrical Engineering, The Johns Hopkins University. Plans for further studies are now in formation. The rat is a convenient animal for studying the effect of electricity upon the central nervous system, since its heart recovers spontaneously from ventricular fibrillation produced by the electric current. Series of animals were studied after application of alternating and continuous circuits of 110, 220, 500, and 1,000 volt potentials. The time that the current was allowed to flow was varied in each group. The electrodes were applied to the top of the skull and to the base of the tail.

The mortality increased in proportion

to the depth of the anesthesia. No sex differences in susceptibility to the current were found. Small, young animals were less resistant than adults. With lower voltages, more injuries were produced with the alternating than with the continuous currents, but with 500-volt potential the effects were equalized while at 1,000-volt potential the continuous current produced the greater injury. Many of the animals that survived the shock showed a paralysis of the posterior portion of the body with the subsequent development of incontinence and hematuria. This paralysis was more common with the alternating than with the continuous current. Some rats died during the first few hours from a hemorrhage in the cerebral ventricles. Many others recovered and appeared normal following the injury. The continuous current often produced symptoms of central nervous system irritation while hemorrhages were particularly common with an alternating current. A large hemorrhage in the spinal cord was found in all the rats in which the posterior portion of the body was paralyzed.

The nerve cells also showed characteristic abnormalities.—O. R. Langworthy and W. B. Kouwenhoven, *J. Indust. Hyg.*, XII, 2: 31–65 (Feb.), 1930.

**Proceedings of the Twenty-fifth Anniversary Conference of the National Child Labor Committee held in New York City, December 16–17, 1929**—Addresses by some 15 prominent persons are contained in this 94-page bulletin, which is procurable from the National Child Labor Committee, 215 Fourth Ave., New York, N. Y., *Publication No. 361*, Price 50 cents.

**Control of the Silicosis Hazard in the Hard Rock Industries**—The present paper—part I—deals with a laboratory study of the design of dust control systems for use with pneumatic granite

cutting tools. There is a description of the granite cutting processes, of the tools and machines commonly used, and a classification of the processes according to dustiness, in which it is found that the greatest amount of dust is in connection with hand tools (59.2 million particles per cu. ft.), inside surfacing machines (44.0), outside surfacing machines (43.9), general plant atmosphere (20.2), lathe (17.9), polishing mill (9.0), sandblasting (6.2), saw (4.6), and movements of office employees (1.9).

Laboratory studies were made on dust control methods with a check on numerous features, such as collection of samples, air velocities, variations, air pressure, sharpness of tools, etc., and these in relation to the use of hand tools and surfacing machines.

The efficiency of experimental installations was standardized on the basis of a maximum of 10,000,000 dust particles per cu. ft. of air which was the highest permissible limit set up by Russell and his associates in the U. S. Public Health Service's study at Niagara Falls. It was found that the velocity of air flow at the tool must be at least 200 ft. per minute regardless of the size, shape, and position of the hood and the air flow through it. This value, therefore, may be regarded as a fundamental specification for hood design under laboratory conditions. For the field, it may have to be altered somewhat.

The air flow requirement for the smaller surfacing machine was found to be 315 cu. ft. per minute. A higher rate will be necessary for larger machines.—Theodore Hatch, Philip Drinker, and Sarah P. Choate (Harvard), *J. Indust. Hyg.*, XII, 3: 75–91 (Mar.), 1930.

**Occupation and Health**—Brochures Nos. 177–183 are included in this assignment of the *Encyclopaedia of Hygiene, Pathology and Social Welfare*,

*Studied from the Point of View of Labour, Industry, and Trades.* The present Brochure includes special papers upon blood changes due to occupation, clothing or garment trade, cork and linoleum industry, cotton industry, cyanogen and its compounds, cerium, and coal tar. An attached notice states that with this Brochure all trades and hazards coming under the letter "C" are now complete and ready for binding. Similar items under "A" and "B" have been completed since the publication of the Encyclopaedia began in 1925.—International Labour Office, Geneva, 1930. (World Peace Foundation, 40 Mt. Vernon St., Boston, Mass.)

**The Comparative Action of 5 and 10 per cent Carbon Dioxide Mixtures as Respiratory Stimulants in Carbon Monoxide Poisoning—**Using cats as the experimental animals, observations prompted the two following conclusions: First, that 10 per cent carbon dioxide is more effectual in the treatment of certain degrees of carbon monoxide asphyxia than is the 5 per cent mixture; and second, that artificial respiration should be administered to patients who are breathing but who are suffering from severe grades of asphyxia. In these persons, a brief period of artificial respiration will induce conditions favorable to the stimulation of breathing by the carbon dioxide in the inhalation mixtures.—Douglas P. Murphy and Cecil K. Drinker (Harvard), *J. Indust. Hyg.*, 12, 3: 92–98 (Mar.), 1930.

**The Quantitative Measurement of Human Efficiency under Factory Conditions—**Conclusions: One may summarize the conclusions to be drawn from the laboratory experiments as follows:

1. The measurement of human efficiency should involve records of both production and energy expenditure. The efficient worker is he who (a) has a high production per unit of energy expenditure, and (b) maintains physiologic equilibrium at this level of exertion.

2. In muscular work the pulse pressure (i.e., difference between systolic and diastolic pressures) and pulse product (the pulse pressure multiplied by the pulse rate) are useful measures of energy expenditure, correlating with oxygen consumption. Supposing that one has allowed for constitutional differences in blood pressure readings of two workers turning out equal production, the more efficient has (a) the lower figure for pulse product and (b) the lower figure for standard deviation in a series of pulse product readings.

3. In mental work and in emotion the pulse product is raised. Variation in pulse product follows changes in attention or emotion more closely than does any other blood pressure or pulse rate factor. Here also the more efficient worker, of two turning out equal production, will have the lower and smoother curve for pulse product. A continued high curve would indicate not so much efficiency of attention as a high degree of strain, and high fluctuations would indicate either lack of ability to fix and sustain attention, or lack of emotional control, or perhaps both.

4. There are normal diurnal variations in blood pressure and pulse rate due, in the working day, chiefly to the taking of food. Correction may be made for these variations, particularly in average curves.

—Osgood S. Lovekin (Harvard), *J. Indust. Hyg.*, 12, 3: 99–119 (Mar.), 1930.

# FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

On the Nature and Rôle of the Fatty Acids Essential in Nutrition—This is a supplement to previous work by the same authors (*J. Biol. Chem.*, 82: 345, 1929) in which it was shown that rats on a fat-free diet developed a disease characterized by a scaly condition of the skin later followed by degeneration of the kidneys.

Necrosis of the tail is a symptom and this has been further studied as well as the abnormal kidneys which appear in all autopsies. This degeneration is not the same as that due to vitamin A deficiency, for increased doses of Fraction AD (the non-saponifiable matter of cod liver oil) are without result while vitamin A-free fatty acids are effective. To determine the effect on the kidneys both high and low protein fat-free diets were fed, resulting in evidence of greater kidney destruction in the high protein diet.

An attempt was made to study the water exchange on the fat-free diet. There was found on an average a greater consumption of water, which was reduced by addition of only 10 drops of lard, or 2 per cent of the total diet. Almost twice as much water is consumed as with the controls and this excess is not voided as urine. This loss in the skin and lungs indicates some impairment of these tissues.

To determine the effect of diet on reproduction the fat-free fraction of vitamin E was prepared and given to animals on fat-free diet without noticeable effect toward increased ovulation, which is irregular or absent in the fat-free diet. Doses of curative oils such as corn oil, olive oil or linseed oil immediately restore ovulation. Males on a fat-free diet do not usually mate but when mat-

ing occurs no litters result, while the controls with 10 drops of lard mate and produce normal litters.

An attempt was made to study the curative effect of fatty acids by dividing the diet into groups containing the unsaturated acid such as linoleic, and the saturated acids, stearic, palmitic, etc. Butter and cocoanut oil represent the saturated acids which contain little or no linoleic acid and no other unsaturated acid. Olive oil, corn oil, lard and linseed oil represent the unsaturated fatty acids.

Curative methods of testing were employed after the animals had developed scaly feet and dandruff on the fat-free diets. Butter and cocoanut oil at the 5 drop level are not effective in relieving symptoms. Olive oil is intermediate, corn oil and linseed oil on a par. A study of the composition indicates that linoleic acid is the essential acid and arachidic acid may also be concerned.

Saturated acids were fed as their methyl esters in other experiments together with poppy seed oil, showing that some acid less saturated than oleic is necessary to effect a cure and again pointing to the value of linoleic acid. Lecithin was no more effective than the methyl esters of the fatty acids. This test showed conclusively that the saturated acids in cocoanut oil and methyl stearate will not promote growth or cure the skin regardless of their high food value. Butter, as much as 3 per cent of the total diet, does not cure the skin condition, again supporting the view that vitamin A deficiency is not involved. While cautioning against conclusions concerning human nutrition, it is suggested that warm-blooded animals

cannot synthesize much linoleic acid and that the same is probably true of other unsaturated acids, but that linoleic acid (and possibly others) is an essential fatty acid in nutrition.—George O. Burr and Mildred M. Burr, *J. Biol. Chem.*, 86: 587 (Apr.), 1930.

**Effect of Varying Amounts of Menhaden Oil in the Diet on the Composition of the Body Fat of the White Rat. The Storage of Highly Unsaturated Fatty Acids**—Reference is made to many investigations showing the importance of fat in the diet and that the body fat of the same species of animals can be much modified. Particularly it was shown in the author's report (*Proc. Soc. Exper. Biol. & Med.*, 24: 704, 1929) that feeding of 20 per cent of whale oil to white rats resulted in an equilibrium between the diet and the stored fat in 4 to 6 weeks. This work covers the effect of varying amounts of menhaden oil on the composition of fat of white rats. The oil used had an iodine number of 169.7, and the fatty acid yielded 54.8 per cent of ether-insoluble bromides. Diets containing from 0 to 30 per cent of this oil resulted in increased amounts of unsaturated acids in the body fat. Adult rats were used and were partially starved for 4 weeks by a fat-free diet to which was added a small amount of cod liver oil (4 c.c. per kg. dry mixture).

Tables show the amount of oil administered, food and oil consumption, and the weight changes. Physical conditions at the end of the experiment were good and no deleterious effects observed with 30 per cent menhaden oil.

Five rats from each group were killed and body fat rendered and analyzed. The iodine number was determined and the fat brominated. The analyses show unmistakably high deposit of highly unsaturated fatty acids fairly proportionate to the amounts administered in the menhaden oil.

The amounts of unsaturated acids deposited vary from 9.7 to 17.2 per cent and, with the 5 per cent diet, to 30 per cent menhaden oil. Since the deposited acids are more unsaturated than those of the original menhaden oil the explanation is offered that either in the metabolism of certain acids of the fish oil those of lower weight are removed and those of higher weight, that is, more unsaturated acids, are deposited, or that the unsaturated acids are further desaturated in the body by the introduction of more double bonds.—J. B. Brown and S. G. Morris, *J. Nutrition*, 2: 509 (May), 1930.

**Studies of Vitamin C in Fresh and Canned Tomatoes**—In view of the importance of tomatoes as an antiscorbutic, experiments were undertaken to determine the relative value of canned tomatoes to fresh, and to answer other questions involved. The curative method was employed on guinea pigs which had been fed scorbutic diet until symptoms such as "jerky run" or swollen wrists were noted. Feeding was continued 16 days, followed by autopsy.

The ration was chiefly soya bean flour, dried yeast, casein with mineral salts and butter fat. Two types of canned tomatoes, cold-pack and open kettle, were used, sterilization consisting of boiling 20 minutes in water. Green tomato pickles were prepared without spice, onion and pepper. Artificially colored tomatoes were produced by treatment with ethylene air 1 to 1,000 from 4 to 8 days.

Results show 2 gm. daily of raw tomatoes, field ripened, insufficient for recovery, which is practically complete with 3-gm. dosage. Practically complete recovery was found in the cold-pack canned tomatoes with 3-gm. dosage after these cans had been stored 9 months. Tomatoes canned by the open kettle method did not give complete re-

covery with even 4-gm. dosage, indicating loss of vitamin C by oxidation. In cold-pack, field ripened tomatoes stored 15 to 20 months, a 4-gm. daily dose was necessary. Storage loss is also shown in the green canned cold-pack tomatoes which required 5-gm. dosage after 9 months, and after 15 to 20 months this amount did not result in the same degree of recovery.

By comparison, greenhouse ripened tomatoes are not quite so potent in vitamin C as those ripened in the field. The ethylene colored tomatoes required 4 gm. for recovery, indicating that ethylene does not prevent the development of vitamin C but is comparable to the greenhouse ripened tomatoes. Green tomatoes ripened in a dark room effected practical recovery with 3-gm. dosage, showing the development of vitamin C after severing from the vine. Field matured green tomatoes were stored until soft, then fed at the 5-gm. level, which showed approximate recovery, indicating a superiority over the fresh canned tomatoes from the vine but comparable with these same tomatoes canned by the cold-pack method, indicating a slight superiority for this method as a source of vitamin C compared to the raw, green tomatoes.

The vitamin C content of green tomato pickles was found to be negligible.—Bertha Clow and Abby L. Marlatt, *J. Agri. Res.*, 40: 767 (Apr. 15), 1930.

**Further Evidence for a Third Accessory "B" Factor**—This author has previously presented evidence of the division of the vitamin B Complex into three components (*Biochem. J.*, 23: 689, 1929). This paper records further evidence with respect to these factors. Similar basal diets as on a previous experiment were employed and 3-pigeon-day-doses (approx. 1.0 mg.) were given each rat daily. Vitamin B<sub>3</sub> was obtained from the filtrate of the preparation of vitamin B<sub>1</sub> and was found active

only in the mercuric sulphate precipitate. Details of this separation are to be published.

Two types of experiments were conducted, first, rats which were brought to constant weight on the basal diet plus vitamin B<sub>2</sub> ceased growth at the end of 2–3 weeks. Temporary response followed the addition of vitamin B<sub>1</sub> but no further response by further addition of B<sub>1</sub> or B<sub>2</sub> or both. Vitamin B<sub>3</sub> preparation was administered daily by mouth, and graphs indicate definite resumption of growth by the supply of B<sub>3</sub>.

In the second experiment, rats were brought to constant weight without addition of any of the B vitamins. Vitamin B<sub>1</sub> and vitamin B<sub>3</sub> in amounts shown adequate in previous experiments were fed without increased growth even when doubled. Growth was immediately restored by the unit quantity of vitamin B<sub>2</sub>. The suggestion is offered that the vitamin B<sub>3</sub> factor forms an insoluble mercury salt with mercuric sulphate. The growth curve also indicates that the storage period for vitamin B<sub>3</sub> is approximately 5 weeks compared to 3 weeks with vitamin B<sub>2</sub>.—Vera Reader, *Biochem. J.*, 24: 77, 1930.

**Heat Resistance of the Spores of Clostridium Botulinum**—The purpose of the work reported in this article was to supply spores in large quantities for heat resistance studies. In the course of the work 10 different lots of peptic-digest medium, 12 gelatin mediums, 12 mediums in which peptone served as the basic nitrogen constituent, 4 meat mediums, and over 100 different batches of casein-digest medium with many variations, including the addition of salts and vegetable extracts, were employed for the production of spores of representative strains of *Cl. botulinum*.

Spores grown in 4 per cent peptone showed a resistance of from 1½ to 2½ hours. The addition of phosphate raised the heat tolerance to 4 hours; the



effect, however, was not constant. The addition of glucose and the increase in concentration of peptone raised the number of organisms but not the resistance. A standard casein-digest medium supplemented with Liebig's meat extract was selected as most favorable for the routine production of *Cl. botulinum* spores.

Different lots of casein medium prepared under similar conditions varied in their ability to produce heat resistant organisms. The same lot of medium consistently yielded identical results. Supplementing with different electrolytes, sand, glucose, olive oil, protein or vegetable extracts did not improve the basic substrate. Attempts to increase resistance by selection failed.

Incubation temperatures of 28°, 37° and 41° C. showed little influence on the heat resistance of the organism.

The most resistant organisms were found in 4- to 8-day cultures. The degree of anaerobiosis had no evident effect on the heat resistance of the spores. The apparent heat resistance of a spore suspension increased with its density up to approximately 1 billion per c.c.; beyond this limit it was considered constant.

Spores preserved in their own liquor in the icebox and in a dry state usually deteriorate on standing. Numerous products, however, remained constant over periods of 4 months. As a result of 46 resistance experiments on small spore samples, an average heat tolerance of 4 to 4½ hours was shown.

When the results from 44 pools prepared by the Sharples centrifuge are considered, two maximums, at 3½ and 5 hours, are evident.—E. W. Sommer, *J. Infect. Dis.*, 46: 85 (Feb.), 1930.

## PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.\*

**The Public Health Nurse and Communicable Disease**—Any public health nurse can tell you that some of the families most needy of good nursing care are often those in which one or more children are ill with a communicable disease. Usually the mother has to give nursing care in addition to her other heavy duties, if she has a large family, and this is so much more difficult if the house is small and there must be isolation of the patient and careful technic in guarding the rest of the family and herself. This is one time when the public health nurse is needed badly; yet many visiting nurses in the smaller

communities are not allowed to give bedside care in these cases for fear the public will feel that they will carry the disease from house to house, though no case has ever been reported in which a visiting nurse has carried an infection.

Again school nurses many times visit the homes of school children ill with a communicable disease. One nurse not long ago visited a school child ill with measles. The mother escorted her into the darkened room (which the National Society for the Prevention of Blindness says should not be darkened) and sat in a chair by the sick boy, holding her six months' old baby in her lap. She was eager to take all the nurse's suggestions about the nursing care of her son, and was much surprised that

\* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

she should not take her baby into the sick room.

It would be ideal if school nurses, board of health nurses or visiting nurses could visit every home in which there is a case of communicable disease and after demonstrating nursing care to the mother leave one of the pamphlets explaining the care and hazards of that particular disease. These pamphlets are attractively written and furnished by some of the life insurance companies, or state health departments. Some few mothers may not read them, but more will—and pass them on to the neighbors. An alert nurse will say, "Be sure and have your husband read it, too."

It would be a God-send to any public health nurse if she could also leave a pamphlet with the mother such as has just been published by the Iowa State Board of Health, *Management of Cases of Communicable Diseases in Isolation or Quarantine at Home or in Hospital*, written by the Directors of the Division of Preventable Diseases and the Division of Public Health Nursing. Most of the pamphlet "deals with the arrangement of the patient's room, the precautions to be taken to prevent the spread of disease, and the method of disinfection to be used during the course of the illness and after recovery." It is written very plainly and attractively with plenty of illustrations; any mother can understand it.

The physicians and health officers complain that so many families go to great length to escape or avoid quarantine. It is probably because most of them do not really understand the need of it. This same pamphlet "contains certain definitions and citations of the laws and regulations pertaining to notification and the placing of a warning sign on the premises."

Surely the nurse who has visited a case of communicable disease, has helped to interpret the doctor's orders in regard to it, has demonstrated nursing care and

left a pamphlet like this one from Iowa, together with a specific pamphlet about the disease, has done a great deal to protect the patient and his family and the community, and to make it easier for the physician and health officer.

### Public Health Nurses in Michigan, 1929-1930—

Number of county nurses (exclusive of Children's Fund) .....	56
School nurses .....	163
Tuberculosis nurses .....	28
Industrial nurses .....	58
Visiting nurses .....	62
General Public Health nurses .....	89
Children's Fund of Michigan nurses .....	14
Metropolitan Life Insurance Co. nurses ..	23
State Department of Health nurses .....	9
<hr/> Total .....	502
Number of counties employing nurses ...	31
Financed entirely by Boards of Supervisors .....	19
Financed by Red Cross and supervisors ..	6
Financed by tuberculosis funds .....	9
Counties having nurses from the Children's Fund of Michigan .....	9
Number of County Health Units financed by Children's Fund .....	9
County Health Units financed by Supervisors, Rockefeller Foundation and State .....	5

The nurses with the Children's Fund of Michigan are all doing county work and the majority of the tuberculosis nurses have a county wide program.

The above figures do not include the staffs in Detroit.—*News Letter to Public Health Nurses*, Bureau of Child Hygiene and Public Health Nursing, Mich. Dept. Health, May, 1930, p. 5.

**The Staff Education Plan in Montreal**—Weekly conferences are held in each district in the Montreal District of the Victorian Order of Nurses. Plans are made ahead of time to have members of the staff take a definite part, in order that the conferences may not become dominated by the supervisor.

Last winter the nurses prepared a series of ante-natal talks for mothers to

be given at the district conferences. They chose their own topics and prepared 4 papers with some help from the supervisor. This gave them much needed practice in planning group talks.

We quote *The Canadian Nurse* of February, 1930, as to why the plan is of value:

1. To the Staff Nurse:
  - (a) Because it provides her with the incentive to do considerable reading;
  - (b) The opportunity to do some creative work;
  - (c) The opportunity to do some public speaking.
2. To the Supervisor:
  - (a) It enables her to evaluate the teaching ability of the nurse;
  - (b) To select nurses best suited to answer the call for "health talks";
  - (c) The opportunity of knowing, and consequently being the better able to strengthen, the weak joints in her armour.
3. The whole group is benefitted by the discussion which follows and the new nurses on the staff are helped and stimulated.

To make reference reading easier a committee, appointed each month from the staff, looks through the magazines and tabulates and files all articles that they consider will be of value to them in their work.

No extra time is allowed for any of this work. If possible, some of it may be done in office time, and the stenographer does what she can to help. The benefits that accrue to the nurse should more than offset the disadvantages, and most of the nurses are willing to admit that the time is well spent.—Staff Education in the Victorian Order of Nurses, Canada, *Internat. Nurs. Rev.*, Mar., 1930, p. 206.

**We Need a Higher Standard of Admission to Nursing Schools**—Of the 524 nursing schools situated in the northeastern states comprising New England and the Middle States 56 per cent require only 1 year of high school for entrance, 28 per cent require 2

years, 2 per cent require 3 years and 14 per cent have a 4-year requirement.

"One of the three great questions involved in the training of nurses or any other group of professional workers is the question of their preliminary education." Twenty-nine out of each 100 students in these 524 nursing schools had not enough preliminary education to enter any normal school in these 10 states. However, 68 per cent of the total students accepted in the schools had had 4 years of high school education, though this standard was not required in the states in which they were located.

Nursing leaders agree that 4 years of high school should be one of the standards of admission to a nursing school, for as Dr. Burgess says in *Nurses, Patients, and Pocketbooks*, "The young women who in this day of free education have not had the ambition, energy or good sense to carry them through high school, are not the material at all which we should expect to make nurses."

Maryland, Oregon, Rhode Island, Utah and Washington require 4 years of high school for admission to their nursing schools, and Colorado, Alabama, New York and Idaho have recently passed laws requiring high school education for admission; all other states require less.

An intelligent public opinion must be produced on the facts in training schools as they are operated today, and nurses must lead in the reforms that must take place in the nursing profession; but it is futile to expect that any discussion of nursing school needs will have any effect upon the situation unless it—"overflows the banks of your professional stream and engulfs the general public."—E. Everett Cartwright, This and That in Nursing Education and Practice, *Am. J. Nurs.*, XXX, 5: 617, 618, 619, 624, 627 (May), 1930.

# EDUCATION AND PUBLICITY

EVART G. ROUTZAHN\*

**A Neighborhood Demonstration**—A Clean-up Demonstration was conducted by the various community and social agencies connected with the Lower East Side Community Council in New York City. They chose a small area of two square blocks—from Jefferson to Rutgers Streets and from Madison to Cherry Streets—so that the checking up would not be impossible.

The drive started off with all sorts of meetings—interested agencies, the landlords, fathers and mothers, and children, and the Madison House Clubs, etc., all eager for action.

People were very much interested, fathers being particularly responsive and anxious to help in inspection, for which purpose they received letters as credentials. The children were held responsible for cleaning houses and had daily reports to make on printed forms. They were given a point system for grading the homes they described. The schools held an essay contest in which all the classes from 4B to 9B participated, each class getting a button, and a medal being given to the best essay in each grade—all this at a formal assembly.

One hundred and fifty organizations sent out trained visitors with sets of printed instructions so that each family in the 1,356 apartments of the district was visited.

The landlords agreed to help, improving hallways, shaftways, etc., feeling, too, that it would help them to keep their houses filled.

The educational side of the demon-

stration included the distribution of informational pamphlets, display posters, movies, lectures, lantern slides, essay contest, and score cards, badges, etc., programs at church and Hebrew schools, newspaper publicity, and a printed report of the demonstration. The League of Women Voters issued a pamphlet on violations of the law involved.—Babette Langsdorf.

**Welcome to a Guest Editor**—Welcome to Dr. H. E. Kleinschmidt, health education director of the National Tuberculosis Association, who will edit this department in the September and October issues.

The year round editor plans to sail eastward July 16, reaching New York again September 19. The main objectives are the International Hygiene Exposition at Dresden and the social museums in Munich, affording unequalled opportunities for the study of German methods of graphic presentation of facts and ideas.

Dr. Kleinschmidt, who has kindly agreed to carry this department, has had a more varied experience in health education, probably, than anyone else. In two national and one city health agencies, and a state department, he has produced motion pictures, exhibits, posters and other materials; has talked and written on the subject; and has been a pillar of the popular Health Education Section of the A. P. H. A.

No instructions have been passed on to Dr. Kleinschmidt. We count on a different treatment of the subject in those two issues. Much, of course, depends upon what is sent by health workers to his address, 370 7th Ave., New

\* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

York, N. Y. He will welcome questions and problems, and those good samples of your publicity materials and descriptions of devices and methods.

**Early Diagnosis Campaign, 1930**—The campaign succeeded this year in reaching very effectively the medical profession through the distribution of the diagnostic manual, "Childhood Type of Tuberculosis." Though the book was an expensive printing job, it was necessary to print 40,000 copies to meet the demand. Free copies were made available to the 4,500 senior medical students. Comments from medical teachers, specialists, and practitioners were numerous and universally favorable.

Dr. Algernon B. Jackson, professor of hygiene of Howard University, Washington, D. C., was engaged to make a special lecture tour to 12 Negro normal schools and colleges in the South.

For Negro groups, there was a Negro poster like that for general groups except that it was illustrated with a portrait of a Negro child. This poster was popular greatly beyond expectations, and for no other reason, we believe, than that it featured the Negro child. In many places, tie-ups were made with Negro Health Week.

Radio announcers and advertisers were furnished with announcements and short talks. A considerable number made use of them. One station asked for additional copy because the previous copy had proved so popular. We found also that, while it was difficult to secure good hours on the larger stations, our local secretaries succeeded in getting liberal allotments of time on local stations. One state association arranged for a series of ten 5-minute talks on successive days by different speakers.

The 6,000 24-sheet billboard posters were favorably received, but for the first time in our experience protests against the use of the billboard in general were

heard from various parts of the country. A number of persons and organizations deplored the fact that tuberculosis associations encouraged the perpetuation of the billboard by using them. The National Association has not yet taken a stand on the question nor adopted a definite policy.—H. E. Kleinschmidt.

**Health Education in a Professional Magazine**—In *Public Health Nurse*, 370 7th Ave., New York, N. Y., June, 1930. 35 cents. "The Nurse's Message of Child Health to the Family" (includes interpretation of printed publicity); "Child Study Program Applied to a Public Health Organization" (includes child study and health discussion groups); "The Nursery School—A Learning-Living Place" (includes "learning through living"); "New York Experiments in State-wide Staff Education" (Division of Health Nursing, State Department of Health); "Community Organization for Health" (includes the education of women in England); "Responsibilities and Duties of Advisory Board Members" (includes plea by a board member for more education of board members); "Report of the New England Health Institute"; "One Day Institute Board and Committee Members' Section, Rhode Island"; "Board Members' Institute, Syracuse"; and "A Year-Round Publicity Program for Public Health Nursing Organizations."

**Why Not the Silent Film?**—"Ill blows the wind that profits nobody."—Shakespeare.

The advent of the Talkie has opened new and heretofore unavailable opportunities to the tuberculosis and public health movement in that the silent film field has been abandoned by the commercial groups and is now available for complete and non-competed exploitation by the educational bodies.

Whereas Hollywood previously

crowded the non-entertainment film out of the picture and allowed it only a small margin of usefulness, now, since the movie has found its voice, we are free to utilize the commercially abandoned old-style cinema. If we now appreciate our opportunities and hasten to embrace them, we will add a valuable instrument to our educational means.

The recent and phenomenal development of the amateur movie, the perfection of the amateur movie camera capable, because of its rapid lenses, of taking pictures in ordinary light, the production of simple lighting facilities which can be attached to practically any lighting circuit, the availableness and cheapness of the 16 millimeter reversible film purchasable at less than \$5 per 100 feet, including all processing, and the perfection of the amateur projection machine, and screens which give good pictures make the exploitation of the silent film easier and cheaper now than before.

The spheres of exploitation of the silent film still remain wide. The public school assembly, the classroom, the mothers' meeting, the boys' and girls' club, church groups, the union meeting, all of these and many others offer opportunities for the showing of silent films.

Amateur equipment is relatively inexpensive, easy to handle and easy to transport. The camera need not cost more than \$100—the film would cost less than \$5 per 100 feet, \$20 for 400-foot reels, equal to 1,000 feet of standard 36 millimeter film. (Projection time approximately 16 minutes.)

Projection machines cost from \$50 to \$250. Sixteen millimeter films are of the safety type—that is, non-inflammable. The films are easy to handle and to store. Neither license nor booth is required for projection. Excellent screens of the glass bead variety are available to receive the projected picture. These also are easily transported. Several lecturers employed by the Col-

gate-Palmolive Organization have for several years made the circuits of the schools delivering lectures on oral hygiene and have carried without difficulty their projection machines and films.

The amateur films offer new opportunities which the professional films did not. Thus, since nearly every city has a film service where the 16 millimeter films may be rented, these services can be exploited for the distribution of health films. "Jinx," "The Kid Comes Through," and a number of others of our health films can be converted into the 16 millimeter size and loaned for projection at private homes.

Schools could be persuaded to make their own health films on a project method: the English, biology and hygiene departments could supply the plot, the dramatic director choosing and directing the cast, the manual training department supplying sets, etc., and the whole school coöperating in finishing the project.

The costs of the project could be recovered through admissions charged at the showing of the film. The interest of the parents could be enlisted in the review of the film.

There are a variety of ways in which this last opportunity could be exploited. Pantomime and puppets could be used in the making of health films. Prize competitions might be held among the schools for the best film produced. Health organizations could coöperate with schools by making available, on a loan basis to the schools requiring them, motion picture cameras, lighting facilities and projection machines.

Visual instructions in health could thus be promoted and recognized by all. There are items which can best be presented by the silent film. The health movement never adequately exploited the opportunities represented by the motion picture but now a new opportunity is offered to us.—Iago Galdston, M.D. (Mimeographed copies of above

free from National Tuberculosis Association, 370 7th Ave., New York, N. Y.)

Dr. Galdston says so well and in such specific detail what we have hinted at in this department. We believe that health and social welfare agencies have had thrust upon them practically a new medium and a new method. The growth of the amateur movie club seems to point the way. We look forward to local, state, and national health and social welfare movie competitions. Later there will be discussion in this department of the use of amateur movies.

The best single source of information is the Amateur Cinema League (and its magazine, *Movie Makers*), 105 West 40th St., New York, N. Y.

A second source is the *Educational Screen*, 5 South Wabash Ave., Chicago, Ill., with an amateur movie department edited by Dwight R. Furness, who is active in the Social Work Publicity Council. Write to both above addresses for sample copies.

### Publicity Task of Mental Hygiene

—From Germany Dr. Hans Roemer brought to the International Congress for Mental Hygiene a description of the opposition to up-to-date treatment of the mentally diseased which might apply very well to other countries. To public opinion, he says, the mentally diseased individual is unpleasant, undesired, inconvenient. He is looked upon as burdensome, annoying, even sinister.

Prejudice is directed not only against the insane but against the asylum and the alienist. These prejudices of public opinion that, largely in the form of antiquated laws, have been carried over from obsolete stages of development to our own time have become great hindrances to progress in care of the insane.

On the other hand there are some rays of light that promise a better future. In the important field of the administration of social service and of law, the psychiatrically oriented system

of an active social pedagogy has begun to regulate the relations of the conspicuous psychopath to society. This new social, educational orientation will, through public opinion, gradually prepare the way for improvement in the treatment of the insane.

We alienists, Dr. Roemer continues, see clearly laid out for us the road to progress. We have to win for the care of our patients a place in the realm of active social pedagogy within the field of health service, and to win over public opinion by means of systematic enlightenment.

The removal of the hindering prejudices that public opinion has dragged along from past days can be accomplished by psychiatric enlightenment in connection with the general education of the people in hygiene.

In the solving of all these problems we must assure ourselves of the coöperation of the members of private social service organizations who have already so successfully won the far reaching help of public opinion in other common goals. —Dr. Hans Roemer, *To What Extent Does Public Opinion Help, and to What Extent Does It Impair the Work of Mental Hygiene?* First International Congress on Mental Hygiene.

### MAGAZINE ARTICLES

"Cinderella's Slippers," by G. F. Alsop, M.D. *Woman's Journal*, 171 Madison Ave., New York, N. Y. June, 1930. 25 cents. Feet, shoes, health.

"Fat or Thin Women," by Brenda Ueland. *Saturday Evening Post*. May 10, 1930.

"Right from the Heart," by R. E. Wadsworth, M.D. *Collier's*. May 24, 1930.

"Sensible Sixties," by S. G. Blythe. *Saturday Evening Post*. May 17, 1930.

"The World's Future Population," by R. E. Kuczynski. *New Republic*, 421 West 21st St., New York, N. Y. May 7, 1930. 15 cents.

## BOOKS AND REPORTS

**The Story of San Michele—By Axel Munthe.** *New York: Dutton, 1929.* 530 pp. Price, \$3.75.

This autobiography is entirely different from any which the reviewer has ever read. It is the story of a Swedish physician who graduated in Paris and acquired a large practice, becoming a fashionable physician. He always found time, however, to look after the poor in an Italian as well as a Swedish colony. His outstanding characteristics seem to have been a clear insight into human nature, an intense love for animals of all kinds, especially dogs, and a revolt against the social injustices. The book is not so much a detailed description of his life as a succession of dramatic incidents. His description of the cholera epidemic in Naples is ghastly, as is his account of the diphtheria and scarlet fever outbreaks among the poor Italians and Swedes in Paris.

The book is beautifully written. The author has a fine dramatic instinct. His description of death, which he personifies, as he has seen Him in the wards of the hospital, on the battlefield, and elsewhere, is most dramatic. He was a student of Charcot's, and apparently one of that great man's favorites, though he offended him later. He attributes his success largely to the influence of his teacher. He found, as do most physicians who handle nervous diseases, that many of his patients were suffering from imaginary diseases, and it is quite amusing to read how he substituted "colitis"—whatever that term meant—for appendicitis, which was then the fashionable ailment, and how he cured these cases by getting his patients—usually rich and idle women—interested in

something outside of themselves—a dog in one case, making dolls for poor children in another, etc.

Apart from the intense interest of the story itself, the book will recall to all physicians, particularly those specializing in nervous affections, incidents in their own lives. Eventually the author broke down under the strain, bought the retreat known as "San Michele," from which the title is derived, where he established himself, founded a retreat for the animals and birds he loved so well, and reconstructed some of the relics of Roman civilization which abounded in the ruins. After a rest he recovered, and for some years practised in Rome during the fashionable season, becoming the fashionable doctor of that city as he had been in Paris. We understand that the proceeds from the book will be given to the Society of Naples for the Protection of Animals.

It is hard to praise this book too highly. The introductory chapter is difficult, but from that time on, one's interest is held without a break.

M. P. RAVENEL

**The Diagnosis of Health—By William R. P. Emerson, M.D.** *Appleton, 1930.* 272 pp. Price, \$3.00.

The most refreshing points of Dr. Emerson's new book are found in the definite start and goal he sets up for the individual who reads that book with a view to bettering his own health. Add to those points the fact that the writer simply and convincingly sets forth how to proceed from that start to that goal. One can understand the satisfaction any individual floundering about in search of health may get from this volume.

In his Part I, Dr. Emerson immedi-



ately puts the emphasis where it belongs—in a book carrying this title—on health; not on disease cure, treatment, or prevention. The various chapters of this part interpret health rating, signs and essentials of health, understanding and use of the weight table, the individual's history approached from the health angle rather than the disease angle, health intelligence as a factor in health building—all developed with a vision reaching far beyond the diagnosis toward the follow-up, leading in the direction of health—positive.

Part II, Training for Physical Fitness, very logically presents the analysis of certain procedure and results as observed in actual class study and experiment in nutrition, in work, in rest, in recreation, and in health habits in their relation to individual health. As Dr. Emerson says, "The whole object of the class is to help the student help himself." The reader is quite likely to feel, also, that the object of those chapters is to help the individual help himself, wherever he is.

Part III, Problems in Health Diagnosis, covers certain conditions found to exist in groups and with individuals, and how those conditions have been handled or are waiting to be handled to the increased health of the individual.

In addition to the clarity with which these three divisions of Dr. Emerson's book point to the road the individual should travel toward his own health, *Diagnosis of Health* also gives pointed evidence that all such increase in individual health necessarily makes for an increase in all public health and general public welfare. LENNA L. MEANES

**What Is Eugenics?**—By Major Leonard Darwin. New York: Galton, 1929. Price, \$1.00.

This little volume is practically a condensation of the larger book published in 1926 by the same author, *The Need for Eugenic Reform*. Major Darwin is

the greatest authority on the subject of which he treats in the world today, and what he writes is worthy of close attention.

The book can be commended for general reading, professional as well as lay.

M. P. RAVENEL

**Shattering Health Superstitions—**

By Morris Fishbein, M.D. New York: Horace Liveright, Inc., 1930.

245 pp. Price, \$2.00.

The number of superstitions discussed in this book exactly equal the variety of pickles of a certain brand. Of the fifty-seven superstitions all but two are demolished. These two which survive on some basis of fact are—that brainy people have big heads; and that rheumatic joints, like the weather bureau, are sometimes reliable in forecasting changes in the weather. The book has fifty-seven chapters—one superstition per chapter.

Dr. Fishbein takes us on a tour of the darker recesses of the human mind which lie off the paths of everyday expression. Apparently there are still bats in many human belfries.

There is some evidence of hasty preparation, which is not to be wondered at considering the enormous weekly output of this very prolific writer.

In discussing smallpox on page 202 he says, "Essentially, vaccination is the means of giving the person a mild attack of the disorder." According to Rosenau, smallpox may be converted into cowpox by passing variolous matter through calves, but when thus established it remains fixed and never reverts to smallpox. Since modern vaccination requires the use of bovine virus, the author's definition might better apply to the Chinese method of insufflation of human virus into the nasal cavity. The hope there is to give the person a mild attack of the disorder.

In discussing the transmission of disease causing organisms by the air route,

the wisdom of excluding the following statement may be questioned: "Nowadays it is generally recognized that few diseases are spread in this way, and there is even beginning to be some doubt that moist droplets expelled from the nose and throat will carry with them the germs of disease sufficient in number to affect other persons." Fortunately, the author adds, "In the interest of safety against tuberculosis, pneumonia and other diseases affecting the lungs particularly it is best for people to continue to cover up each cough and sneeze."

W. W. PETER

**The Immunology of Parasitic Infections**—By *William H. Taliaferro, Ph.D.* New York: Century, 1929. 414 pp. Price, \$6.00.

This book fills a distinct need in the fields of immunology and parasitology, for hitherto there has been no collection of immunological contributions in parasitology, to say nothing of an interpretation of many of the findings. The purpose of the book is best stated in the words of the author in his preface:

Besides stimulating interest in this field I hope that the present work will hasten the incorporation of these experimental data into both parasitology and immunology where . . . it has been largely neglected. By achieving this the parasitologist will undoubtedly gain new concepts . . . and the immunologist can obtain unique material for certain immunological questions.

The author further points out that the zoölogist's concept of zoöparasitism differs in its viewpoint and in its use of certain terms from the concept of bacterial parasitism held by bacteriologists and workers in medical fields by whom most of the work in immunology has been done.

The arrangement of the material makes it especially available to readers interested in special fields of investigation. After an introductory chapter dealing with parasitic infections in general and a chapter describing the various phenomena used in studies of im-

munity, various parasitic diseases are considered in detail from the standpoint of the immunological responses they provoke in the host. Of particular interest are the chapters on the protective and curative actions of immune serums and hypersensitiveness and cutaneous tests used for diagnosis. Much misunderstanding has existed regarding the protective and curative action of immune serums because of the conflicting nature of the reports. By collecting them all and criticising them from the point of view of the parasitologist, Dr. Taliaferro has made a contribution of considerable value. The bibliography requires more than passing mention, for it is unusually complete and the references have been given in detail in such a manner as to make them most useful to the student and investigator. Likewise, the index has been carefully done and is exceptionally complete.

N. W. LARKUM

**Factors in the Sex Life of Twenty-Two Hundred Women**—By *Katharine Bement Davis, Ph.D.* New York: Harper, 1929. 430 pp. Price, \$3.50.

The value of this book cannot be overestimated as regards a new fund of knowledge, and the possibility of the application of that knowledge in the field of social hygiene. It is enlightening in so far as it gives a better insight into the sex life and sex motives of at least one group or a representative number of such a group of women. It is interesting coming at this time when the trend in modern literature, the stage and the screen is toward the discussion of more and more intimate sex relationship.

To say that its fund of information is exhaustive would be overestimating the book and underestimating the complexity of the sex in question. A group of 2,200 women, most of them college graduates and nearly half of them en-

gaged at one time or another in teaching, does not represent a cross-section of American womanhood. However, the histories supplied by these women do give a definite understanding and a definite knowledge concerning the sex life within their own social and educational spheres. As the author herself states, the statistics set forth by this group will hardly hold for a similar representation of women from other walks of life.

One of the results of greatest importance in this investigation, to my way of thinking, is the proof of at least reasonable success in using the questionnaire method of compiling statistics. To be sure, religious training, social environments, education, and many other factors play a part in the correctness of answers to such inquiry. Subconscious, as well as conscious inhibitions modify their exactness. On the whole, however, it would seem that information was honestly given and I truly think that the success of this work opens the way for vast fields of investigation through the avenue of the anonymous questionnaire method.

LOUIS E. SCHMIDT

**Sewerage and Sewage Disposal.** A Textbook—By *Leonard Metcalf and Harrison P. Eddy*. (2d ed.) New York: McGraw-Hill, 1930. 783 pp. Price, \$6.00.

The second edition contains much new material, bringing the subject matter quite up to date. It comprises 783 pages, an increase of 185 over the first edition, 343 of which are devoted to sewerage and 400 to sewage and sewage disposal. The whole has been rearranged and in large part rewritten. In the first chapter will be found a brief but excellent historical review of the entire subject with an outline of the principles involved, including those of plumbing.

The problem of runoff is dealt with in Chapter III with more thoroughness

than the writer has seen in other textbooks, explaining the application and importance of recognizing the "zone principle" in estimating storm flow by the rational method—a matter frequently ignored by the practicing engineer.

If carried out in detail the computation is somewhat laborious and the authors point out that the curves shown in Figure 22, based on a rectangular area with a length equaling four times the breadth, will give reasonably satisfactory results with ordinary collecting areas, while, for preliminary estimates without adequate rainfall data, the McMath formula, judiciously applied, serves an excellent purpose.

Much fresh material will be found in the chapter on the Hydraulics of Sewers, such as "banking" on curves, non-uniform flow near outlets having a free discharge, backwater, the hydraulic jump, the Venturi flume and chemical methods of gaging—subjects not always found in textbooks on sewerage.

Particular mention should be made of the treatment of side weirs and pumps (Chapter VI), loads on sewers (Chapter IX) and the chemistry of sewage (including a discussion of hydrogen ion concentration).

Dilution is adequately treated in Chapter XII, taking advantage of the excellent experimental work recently carried out by the U. S. Public Health Service on the Ohio and Illinois Rivers. The still more recent results of experiments in dilution and the dispersion of sewage discharged from submerged outlets at Los Angeles and other California cities were unfortunately not available at the time of publication.

In speaking of screens (Chapter XV), the authors say: "The term *screen* should be limited to the type employing wire cloth or perforated plates." What are commonly called *bar screens*, such as those installed at Hamburg, Frankfurt, and London, are classed as *racks*.

If these have a clear opening over 2" in size they are designated as *coarse*; with spaces of 1" to 2" as *medium*, and if less than 1" as *fine*. Screens with openings  $\frac{1}{4}$ " or more in size are *medium* and those of smaller size *fine*. Regarding efficiency tests for screens, the authors state (p. 503):

Whether it is practicable to ascertain, even with approximate accuracy, the screen efficiency by determining the suspended or settling solids in the sewage before and after screening is doubtful, for a very large proportion of the substance removed, especially with coarse screens, is of such a nature that it cannot be sampled fairly by practicable methods.

Skimming tanks, which are a rather recent innovation in sewage works, are also described in Chapter XVI (pp. 513-516).

Why the term "Sedimentation Basin" is used in the caption to Chapter XVI instead of "Sedimentation Tanks," as in the following text and as commonly used in practice, is not clear.

Referring to the activated sludge process (Chapter XVIII), a distinction is made between Diffused-air Aeration and Mechanical Aeration by denoting the latter as Bio-aeration, confining the use of Activated Sludge to the former. Air cleaning and contact aerators are given the prominence they deserve in dealing with the subject of activated sludge.

The final chapter (XXI) on Financial Considerations will be found valuable to the inexperienced engineer planning the installation of sewerage works. The methods of estimating, the significance of index numbers, overhead expense, contractor's profit, engineering costs and interest during construction, in addition to unit prices, are explained and given due weight.

At the end of each chapter references to original sources of information are given and, where desirable, practical examples are worked out as a guide to the method to be followed.

The book contains a fund of information brought up to date in a clear, con-

cise style. Having received the scrutiny of Professors Richard G. Tyler and Gordon M. Fair as well as other competent authorities before presentation to the public it will serve as a safe guide to the practicing engineer as well as the student, for whom it is especially intended.

The general make-up of the book is excellent, the illustrations are numerous, well-selected and clear, and there is an index of 38 pages. It will serve as a convenient book of reference and a worthy successor to the many treatises on sewerage that have appeared since those of Latham and Adams.

KENNETH ALLEN

Through the States with a Seeing Eye—By Richard J. A. Berry, M.D., F.R.C.S., F.R.S. (Edin.). Bristol: John Wright and Sons, Ltd., 1930. 200 pp. Price, \$1.75.

This delightfully written little book is an account of a trip through Canada and the United States made by the author as the guest of the Rockefeller Foundation. Professor Berry certainly has a "seeing eye," and what we are unaccustomed to expect from an Englishman—a keen sense of humor. He shows more knowledge of the history of the United States than many of the natives possess. He cannot help poking a little good natured fun at us over having so many largest cities in the world, so many most beautiful streets in the world, etc. One cannot but regret that he did not include some comments on the various medical schools he visited.

The 25 chapters were broadcast over Australia in an attempt to create friendship for "The States." His comments on prohibition are particularly sane and to the point.

Altogether, the book can be unreservedly recommended. It does everyone good to get the other fellow's point of view of himself once in a while.

M. P. RAVENEL

**Values and Methods in Health Education**—By *Walter Frank Cobb, M.D. Evanston, Ill.: Row, Peterson & Co., 1929. 362 pp. Price, \$2.00.*

The ambitions and difficult purpose and plan of this book as set forth in the preface should be fully accomplished:

The school's program of safeguarding the health of the child devolves chiefly upon the teacher and for her this book is primarily written. In it the study and practice of health essentials are made matters of everyday living, something the pupil can understand and use, for the principles that govern health are, in themselves, of little value to him unless he is trained to appreciate them and to put them into practice. . . . How health instruction may often be correlated with lessons in history, geography and other subjects is pointed out.

Each chapter is divided into two distinct parts. The first gives a concise, accurate and very readable statement on a single subject concerning health; the second provides detailed instructions how to put the idea across to the child. The suggested pictures, tricks, games, booklets, posters, diagrams, slogans and "healthgrams" are clever, well illustrated and should be effective in the hands of a conscientious teacher. It is evident that the author realizes the fact that physiology "as a subject to be studied from the point of view of animal and mineral matter is usually uninteresting to healthy, active, carefree boys and girls," and makes every effort to teach "positive health" and the "why" of hygiene.

The most up-to-date knowledge of all branches of public and private health, including ventilation, serum treatments, mental hygiene, and even sanitary engineering and community health programs, is presented in attractive form with a constant emphasis upon keeping well rather than preventing disease. In fact the teacher is warned to avoid too much zeal in presenting the details of germs and sickness because "wherever we begin trying to be 100 per cent perfect in health matters, there is a danger of de-

veloping notions about disease which may finally affect us as unfavorably as would the disease itself." The teacher is also frequently admonished to practice what is preached and to give due heed to her own health both for the sake of herself and the effects upon her pupils.

The information presented is simple and accurate. We are given the story of the Chinese doctors who for centuries have been paid for keeping people well. There appears to be no basis of fact in this legend, but it so well illustrates the point as to be almost justifiable—like poetic license.

The suggested classroom methods are evidently designed for children in the lower grades. There is no reason why the more advanced half of the book could not be separated, illustrated and made a textbook for high school and a handbook on health for the public. Each chapter is followed by references for further reading which makes it possible to go into every subject in greater detail.

This book should be of real value not only to teachers but also to those public health workers whose duty it is to present their cause to the public in simple, graphic form.

JOHN HALL

**Gewinnung und Kontrolle der Trinkmilch**—Von *Dr. H. H. Boysen. Verlag der Molkerei-Zeitung. Hildesheim: 1929. 77 pp. Price, \$50.*

This is a booklet in which an attempt has been made to emphasize the important facts concerning the production and control of milk supplies from a hygienic standpoint. More than half of the book is devoted to a translation into German of portions of *Standard Methods of Milk Analysis*, of the American Public Health Association. The illustrations are better than in our edition of the above. If brief and pertinent statements are desired they can be found here.

JOHN F. NORTON

**The Hygiene of the School Child—**  
*By Lewis M. Terman and John C. Almack. Boston: Houghton Mifflin, 1929. 505 pp. Price, \$2.50.*

This text, designed for the use of teachers' colleges and teachers, is a thorough revision of a text issued fifteen years ago under the sole authorship of Dr. Lewis M. Terman.

It is divided into five major parts: I—Educational Hygiene; II—The Facts and Principles of Child Growth; III—Growth Disorders, Defects, and Disease; IV—Preventive Mental Hygiene; V—Special Aspects of Educational Hygiene.

Part II should have peculiar significance to school administrators, and to those specializing in the health of children. Part III contains much material which would be peculiarly valuable to nurses and doctors interested in school health supervision, and to teachers and administrators handling special classes for handicapped children.

Part III should be read by every teacher, not only that he or she may keep abreast of this rapidly expanding field of health and education, but that the information may be used in the daily contact with pupils entrusted to them.

This valuable text should be a part of the professional library of school nurses and physicians, and of teachers and school administrators.

CHARLES H. KEENE

**A Handbook of the Mosquitoes of North America. Their Structure. How They Live. How They Carry Disease. How They May be Studied. How They May be Controlled. How They May be Identified—**  
*By Robert Matheson. Springfield, Ill.: Charles C. Thomas, 1929. Price, \$5.50.*

A clear, concise treatise on the North American mosquitoes, especially well organized for the student. The first

four chapters on Characteristics of Mosquitoes, Biology of Mosquitoes, Mosquitoes in Relation to Human Welfare and the Problem of Mosquito Reduction, will prove most valuable to the practitioner. The last three chapters, on collecting and classification, are a little beyond the average practitioner, though very well presented for the systematic student of mosquitoes.

The photographs of breeding places and illustrations of anatomical structures are unusually good. The book is beautifully printed and put together.

L. HASEMAN

**Health Heroes. Edward Livingston Trudeau—**  
*By Grace T. Hallock and C. E. Turner. New York: Heath, 1929. 168 pp. Price, \$1.12.*

The outstanding characteristics of Trudeau, the beloved physician, were his altruism and optimism. These are traits which have marked most of the really great sanitarians. Like Trudeau, such leaders as Sedgwick, Reed, Gorgas, and Vaughan, were invariably gentle, courteous, considerate, and always thoughtful of others. These men were not lacking in force and determination, but they were fair, they were humane, and they seldom displayed those disagreeable qualities which sometimes impair the rest of us.

It is highly desirable that school children, especially those at the impressionable age of adolescence, should read about men with ideals such as those possessed by Trudeau.

This little book is written in a pleasing style, with a fine sympathetic appreciation of the friendly physician of Saranac, who lived an inspiring life of self sacrifice. There may be some stimulation in conflict, but after all, there is greater inspiration in a career which could produce the love, regard, and respect of all fellow-men. This book can be highly recommended for its purpose.

JAMES A. TOBEY

**The Biological Basis of Human Nature**—By *H. S. Jennings*. *New York: W. W. Norton and Co., 1930.* 384 pp. 51 ill. Price, \$4.00.

With modern reforms and reformers running rampant, each basing his gospel on partial information, there is need for an authoritative treatment of the subject of genetics which can be easily understood. Both aspects of this need have been very happily filled by Professor Jennings. His authority cannot be questioned, and his treatment leaves little to be desired.

In many ways he is very fortunate in his subject. Genetics can be made popular with few or none of the drastic popularizing expedients necessary in treating such subjects as relativity or quantum mechanics. The data are obtained by direct observation on systems furnished to order by nature, and the results can be formulated with the employment of a minimum of inference requiring anything like subtle deduction. Hence most laymen possessing the patience required to acquaint themselves with the available data should have no trouble in becoming oriented to a scientific genetic point of view.

Furthermore the appeal of this field is very general. The direct application of the results of genetic studies in the consideration of the problems of eugenics, of specific sociological reforms such as prison reform, of behaviorism, of the mechanism of evolution, of the ethics and philosophy of medicine, lends to it a general interest. In fact there seems a possible bearing even on such speculative ideas as reincarnation. The author has recognized these applications, and each type of evangel can find the bearing of genetics on his particular prejudice sympathetically but impersonally treated.

This type of treatment lends to the volume the character of a well coördinated series of essays. The bulk of each essay is in answer to a series of

direct questions propounded by the author, the first essay, five chapters in length, laying the informational foundation in the science upon which subsequent discussions and applications are based.

Chapter IX deals with "Biological Fallacies and Human Affairs." In it there are listed and discussed some fourteen types of fallacy which may be implicit in the interpretation of experimental work of otherwise high enough caliber. While these are labelled biological fallacies and are all applicable in that field, there are only a few which are so restricted, and this one chapter might well be read with much profit by workers in any field of activity which employs a scientific method.

In the final chapter the author seems to descend from his general high level of treatment, and, in urging the acceptance of the doctrine of emergence as a methodological point of view for workers in biology, uses a type of reasoning which seems to smack of some of the same fallacies he has previously pointed out as underlying the conclusions of certain workers that acquired characters are inherited in the Lamarckian sense. His reason for this stand seems to be summed up in the statement that "the doctrine of emergent evolution is a declaration of independence for biology." The point of view of emergence seems, then, not so much a productive methodology as a desire for a psychic sense of autonomy in biology. The ease with which emergence permits *ad hoc* rationalizations of data, regardless of how complete the picture furnished by the data, would seem to be a high price to pay for such a psychic sense even were such an attitude necessary to the mental happiness of the worker and not justified by any other point of view. It is certainly questionable whether the welfare of biology is bound up in its independence.

The reviewer can conceive of no class

of thinking individuals, not even excluding geneticists, who would not find this volume of extreme interest.

ALLEN E. STEARN

**A Textbook of Physiology for Nurses**—By *W. G. Christian, M.D., and C. C. Haskell, M.D.* St. Louis: Mosby, 1929. 153 pp. Price, \$2.00.

The authors of this volume have treated physiology in a very elementary manner, and in so doing they have made many unavoidably ambiguous statements. The subject matter is not new, as stated in the introduction, but merely condensed and simplified from authentic textbooks.

A book of this type will not fit into the already overcrowded curriculum of the nurses' training schools. The book is not complete enough to meet the requirements of an adequate physiology course. The present trend is to combine anatomy and physiology into one course. In this combination the nurse is given the fundamental knowledge of the two subjects, first, by studying the anatomical structure, and second, by associating the physiology or function of the structure in the body.

Nurses entering training schools for the most part are without previous training in chemistry, which excludes from their comprehension many of the good points of this book. A good textbook of anatomy and physiology includes a greater part of the elementary physiology than this book has to offer.

HOWARD C. COGGESHALL

**The Health Care of the Baby**—By *Louis Fischer, M.D.* New York: Funk & Wagnalls, 1930. 248 pp. Price, \$1.00.

This is a very practical handbook for mothers in which the advice for feeding, first aid, and "what to do until the

doctor comes" is presented in simple language. There are also a number of good recipes.

The chapter on Bad Habits is the weakest in the book. The author is apparently unaware of the recent literature on this subject. This difficulty might easily be offset by supplementing the book with publications on sex and mental hygiene from the Children's Bureau at Washington. DAVID M. LEVY

**A Health Revue—A Pageant of Health Activities and Rules Adapted for Junior High Schools**—By *Margaret Strassler. Introduction by T. M. Muir.* New York: Barnes, 1930. 75 pp. Price, \$1.50.

It is the execution rather than the idea that makes *A Health Revue* a novel and useful addition to the literature on entertainment as a form of health education.

Milk bottles have chased coffee pots before. Queens and courtiers have long given audience to personified carrots and apples. Tooth brush drills are commonplace. However, this revue in which the familiar ten rules of personal hygiene for boys and girls are made a part of a colorful pageant was produced on a grand scale. The household arts department, physical education and arts all worked hard on its preparation. The performance must have been a finished piece of stagecraft. A careful record is set down in this book written by Margaret Strassler. Pictures, diagrams and exact instructions cover every detail so that a junior high school health education department in any part of the country should be able to reproduce faithfully the 3' x 5' cake of soap, the Egyptian dance, the drills, the stage lighting and the costumes.

MARY SWAIN ROUTZAHN



# A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

**Typhoid Fever Rates**—The annual summary of typhoid fever rates of the country evidences again the continued decline of this disease.

ANON. Typhoid in the Large Cities of the United States in 1929. *J. A. M. A.*, 94, 20: 1574 (May 17), 1930.

**Infant Deaths and Health Expenditures**—No demonstrable relationship was found between infant mortality rates and per capita official expenditures for various health services in the statistics included in this study.

BOLT, R. A. Municipal Expenditures for Public Health in Cities of the United States of 70,000 Population and Over for the Year 1923 in Relation to Their Infant Mortality Rates. *Am. J. Hyg.*, 11, 3: 601 (May), 1930.

**Diphtheria Immunization with Toxoid**—"Toxoid should be given without preliminary testing only to children under 6 years. . . . The dilute toxoid reaction test was given to all school children." The paper is well worth reading by all sanitarians having to do with this subject, and who hasn't?

BURKE, F. S. The Administrative Control of the Diphtheria Toxoid Campaign in Toronto. *Canad. Pub. Health J.*, 21, 5: 209 (May), 1930.

**Measuring Residual Chlorine**—An apparatus is described which measures the residual chlorine in treated water supplies. A photo-electric cell records the degree of the color when orthotolidin is added to fresh samples of chlorinated water.

CUTLER, J. W., and GREEN, F. W. Operating Experiences with a New Automatic Residual Chlorine Recorder and Controller. *J. Am. Water Works Assn.*, 22, 6: 755 (June), 1930.

**Noise**—Do you want to measure the noise in your town? This paper tells

you how, and further, tells you what noise does to you.

DENNIS, E. B., JR. Noise—Its Measurement, Effect and Control. *New York State J. Med.*, 30, 10: 573 (May 15), 1930.

**Cod Liver Oil and Viosterol**—Another report of a study which leads to the conclusion that viosterol in the recommended dosages is less effective than cod liver oil in the prevention of rickets. Perhaps rickets is not due to a deficiency of Vitamin D alone.

DESANCTIS, A. G., and CRAIG, J. D. Comparative Value of Viosterol and Cod Liver Oil as Prophylactic Antirachitic Agents. *J. A. M. A.*, 94, 17: 1285 (Apr. 26), 1930.

**Philippine Vaccination History**—The ups and downs of compulsory vaccination through periods of American and native law enforcement furnishes a striking story to refute the anti-vaccinist allegations. Good ammunition.

HITCHINS, A. P. Smallpox. *Pub. Health (Mich.)*, 18, 4: 75 (Apr.), 1930.

**Smallpox Vaccination**—A frank discussion of the disadvantages of vaccination and a detailed account of good technic. The immunization of infants is stressed.

LEAKE, J. P. Vaccination. *New Eng. J. Med.*, 202, 20: (May 15), 1930.

**Rural Health Administration**—The map showing the present status of full-time rural health units will encourage sanitarians who have watched the march of this great project. The total is 505 counties in 35 states.

LUMSDEN, L. L. Extent of Rural Health Service in the United States, 1926-1930. *Pub. Health Rep.*, 45, 19: 1057 (May 9), 1930.

**Prenatal Clinics in Scotland**—This detailed account of the routine employed

for several years in Glasgow will prove interesting to American child hygienists.

MACCUNN, M. P., and WYLIE, M. E. Ante-Natal Care. *Med. Off.*, 43, 19: 209 (May 10), 1930.

**Vitamin B Source**—Wheat germ as a source of vitamin B proved to be a potent growth promoting factor when fed to undernourished children. Rolls made of 50 per cent germ and 50 per cent white flour were used as the dietetic medium.

MORGAN, A. F., and BARRY, M. M. Underweight Children. *Am. J. Dis. Child.*, 39, 5: 935 (May), 1930.

**Immunization Against Disease**—A straightforward, absorbing, lucid story of what is known about the prophylaxis of the several communicable diseases. An outstanding example of a talk for laymen.

PARK, W. H. Serums and Vaccines in Infectious Disease Prevention. *Child H. Bull.*, 6, 3: 73 (May), 1930.

**School Children's Hearing**—"In no group, at any age, when both sexes

were taken together, did the rate of children with significant hearing loss rise as high as 4 per cent." This is one of the conclusions on this experience with the audiometer.

STERLING, F. B., and BELL, E. Hearing of School Children as Measured by the Audiometer and as Related to School Work. *Pub. Health Rep.*, 45, 20: 1117 (May 16), 1930.

**Cancer Research**—What research has done and hopes to do in finding the cause and cure for cancer is told simply and well. The paper prepared for nurses will interest all sanitarians even though it contains little that is very new.

WOGLOM, W. H. Cancer as We Know It. *Am. J. Nurs.*, 30, 5: 543 (May), 1930.

**Cancer and Mineral Oils**—Liquid petrolatum painted on skin of, and fed to, susceptible albino mice produced no cancer. No evidence was found to indicate any danger in the therapeutic use of mineral oils.

WOOD, F. C. The Non-carcinogenic Nature of Purified Mineral Oil. *J. A. M. A.*, 94, 21: 1641 (May 24), 1930.

# HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Sweden—Report of Official Committee on Maternity Welfare Work—The committee of experts appointed by the Social Welfare Department of Sweden in 1926 for the study of maternity-welfare measures issued its report at the end of 1929.

Although acknowledging that maternity welfare work is well developed in Sweden, the committee pointed out the need for improvement. In addition to educational measures of various kinds, better medical care and financial aid were recommended for the expectant mother, the woman in confinement, and the young mother caring for her child.

To improve the medical care, the committee suggests an increase in the facilities for medical examination of and advice to expectant mothers and mothers of young babies. Such examinations are given now only in some cities, but they should be given more generally and more regularly. In smaller communities this work can be performed by the midwives in public service \* but in towns and cities there should be a separate organ, a "bureau for the protection of mothers and children." In the opinion of the committee, some of the existing child welfare agencies could take over this function. For the examinations and advice the midwife should be paid one-half by the mother, the other half by public funds. For the supervision of the care of new-born children, the committee advises the enlistment of the services of the public health officers, the midwives to report the cases of childbirth to the officers who would supervise the new-born infants in their districts.

The committee recommends an increase in the number of beds for mater-

nity cases and the establishment of special maternity hospitals which are to be aided financially by the State, also an increase in the number of homes where expectant mothers unable to work and mothers with infants can find shelter. There is also need for a larger number of visiting housekeepers.

As to the financial aid to mothers, two laws are proposed. One law provides for maternity benefits of 50 kronor (about \$13.40) to be paid on application to women whose income is below a certain specified amount. In such cases midwife service is also to be given. The other proposed law provides a maternity benefit equal to two-thirds of the wages of women in certain occupations to compensate them for the loss of earnings caused by the law prohibiting the employment of women in those occupations for 6 weeks after childbirth. The committee recommends that most of the expenses be met by the State. It also urges close coöperation between the various child welfare agencies.—*Sociala Meddelanden*, Stockholm, 12: 986, 1929.

Let There Be Sight—That an annual report may be attractive, interesting, and enlightening is demonstrated by the National Society for the Prevention of Blindness in its 15th annual record for 1929. An unusually attractive cover arouses interest and prompts one to look inside. Here one finds an excellent photograph of a boy and girl over the caption Healthy, Happy Eyes of Childhood. The table of contents, under the title of the report Let There Be Sight, carries the following section headings: Through Preventing Eye Troubles in Babies; Caring for the Eyes of Preschool Children; Conserving the Sight of School Children; Conserving the Sight of the Worker; Research and

\* In many communities of Sweden midwives are employed by the local government on a salary in order to assure their presence; in addition the patients also pay a certain fee.

Demonstration Projects; Public Education; Coöperation with Other Agencies; Financial Support.

The report is well printed in good type, on paper well adapted to the use of excellent photographs and diagrams which illustrate material in the descriptive text. The incidence of ophthalmia neonatorum in new pupils in schools for the blind for the year 1929 was reported by the American Foundation for the Blind to be 9.5 per cent, a reduction of such incidence to the extent of more than two-thirds in the past 21 years. The importance of effecting the cure of syphilis in the expectant mother or in the father in order to prevent a large percentage of blindness is being increasingly realized by the National Society and by agencies interested in the prevention and cure of venereal disease.

Studies of eyes of preschool children are reported as showing that of 982 tested, 21 per cent had some abnormal condition of the eye. During the year, 92 communities in 12 states and Canada were given demonstrations and general talks on prevention of blindness. The organization of sight-saving classes in schools is described. Specific projects to aid the worker are outlined, as well as research and demonstration projects. The National Society educational campaign included the circulation of about 725,000 pieces of literature, extensive use of charts and exhibits, and 307 lectures which reached an aggregate audience of some 45,000 people.

Copies may be secured upon application to the Society, 370 Seventh Ave., New York, N. Y.

**Lincoln, Neb.**—The 1929 report shows a per capita expenditure by the Health Department of 68 cents. A birth rate of 18.6 and a death rate of 12.9 are recorded. A marked increase in the number of prenatal patients cared for in the General Clinic of the Health Department is noted. Eighteen hun-

dred and fifty-four visits were made during the year to the clinic.

The daily average amount of milk sold in the city was 0.82 pint per capita, based on a population of 70,000. There were 1,189 inspections made of milk plants, 12 of creameries, 194 of ice cream plants, and 939 of dairy farms.

**Colorado Springs, Colo.**—A total of \$27,013 was expended in 1929 by the Colorado Springs Department of Health and Sanitation, which, on an estimate of a population of 36,000, is \$.75 per capita. Sixteen per cent of the budget was for general salaries, 18.5 per cent for medical work for school children, and approximately 10 per cent each for milk control, sanitary work, and communicable disease control. The resident death rate was 14.2 per 1,000, which is lowered to 11.9 when deaths due to tuberculosis contracted elsewhere are excluded. Four typhoid fever deaths were the result of an epidemic of 37 cases due to a raw milk supply.

The report of 39 pages contains several illustrations of Colorado Springs scenery, which tends to fulfil for the interior the promising impression made by an attractive red cover.

**Ottawa, Can.**—Ottawa's outstanding public health occurrence of 1929 was an epidemic of poliomyelitis. The first reported case appeared July 28 in the western part of the city, followed by 3 other cases within the week. The following week 7 were reported, and the week after 1, which indicated a decline in incidence. However, the fourth week showed 16 cases and was followed by 11 to 25 cases per week until late in October. In all, 176 cases were reported with 3 deaths. The age of the patients ranged from 7 months to 25 years, averaging 7.4 years. In only 4 instances were 2 cases reported from the same premises.

As the outbreak was not entirely un-

expected, the health department had prepared a partial list of donors in case of need. Convalescent serum was thus immediately in hand, but in limited amount. This was later supplemented by advertising in the local papers. Daily press articles, the circularizing of physicians, and the calling of a Medical Society meeting formed the publicity, and to improve early diagnosis and reporting, a necessity if the serum treatment was to be successful. In all, 141 cases, or 80 per cent, were hospitalized. Of these, 26 had paralysis on admission. Of the remaining 115 cases, which were given serum treatment, 109, or 95 per cent, recovered completely, 5, or 4.3 per cent, recovered with paralysis, and 1 died. During the first 4 weeks of the epidemic, 23 cases were hospitalized; of these, 17 had terminal paralysis (14 on admission). Of the subsequent 118 cases, 8 had paralysis on admission.

The general death rate from all causes of death for the year was 14.1 per 1,000. The birth rate is the lowest recorded. Infant mortality (118.6) was higher than in 1928, due chiefly to respiratory diseases. The tuberculosis rate was low, 59.9 per 100,000 population. Chicken pox and measles were prevalent during the year.

**Greenwich, Conn.**—The health officer's report for 1929 is contained in the town report and outlines in a comprehensive manner the health program of this community. This report is of more than usual interest because it traces the history of the health department, and of health legislation, and indicates the important place which public health occupies as an official governmental function. The expenditures by the Board of Health last year amounted to \$56,699, while receipts totalled \$773.

There are 4 health stations under the department where prenatal, infant and preschool conferences are held. Greenwich has a Department of Public Health

Nursing with a supervisor under whom all the public health nurses in town, including school nurses, function.

**New Jersey Sanatoriums**—A comprehensive study has been made of tuberculosis patients in New Jersey sanatoriums by the State Department of Institutions and Agencies. In the 25-year period 1904–1929, the death rate from tuberculosis in New Jersey has dropped from 179.5 per 100,000 in 1904 to 74.9 in 1929. Most of the sanatoriums of the counties have been built during the last 20 years and are continually increasing their capacities. Preventorium during the last few years have proved their part in the declining rate by curing children who have been contact cases and who may have a slight trace of tuberculosis. The important part played by state and county tuberculosis leagues and clinics is indicated.

The 5,204 new cases reported to the State Board of Health in 1929 and the 2,917 deaths, together with the 20,000 active cases of tuberculosis on record in the files of the state department, indicate that here as elsewhere are problems still to be solved. Forty-two per cent of the patients entering sanatoriums for the first time are between the ages 15 and 29, and 15 per cent of the females entering are between 15 and 19 years of age. During last year, 41 per cent of the pulmonary cases entered in the far advanced stage, with the same proportion moderately advanced, and 18 per cent in the minimal stages of the disease. Of the patients in sanatoriums, 15 per cent of those discharged remained less than 1 month, 27 per cent less than 2 months, and 38 per cent less than 3 months.

There are 11 county and 1 state sanatoriums. A new children's unit of 114 beds provides preventorium care for children 5 years of age or over, and increases the capacity at Glen Gardner to 377. A 50 per cent increase in the

number of persons in state and county sanatoriums from 32 to 48 per 100,000 population has occurred during the past 10 years. The actual numbers have risen from 996 to 1,887. This means, in view of the decreasing death rate, that better facilities for discovery and treatment have been provided. Tables are presented to show as arrested, apparently arrested, or quiescent, 51 per cent of those discharged who entered with minimal tuberculosis, as contrasted with 31 per cent discharged of those entering with moderately advanced tuberculosis, and only 16 per cent discharged of those entering with far advanced tuberculosis.

Detroit, Mich.—“Personal Health is Public Wealth,” is the title of Detroit’s 1929 report published in the January, 1930, *Bulletin* of the Department of Health. Detroit’s population growth from 465,766 in 1910 to 1,429,200 in 1929 is shown at the outset in tabular form by years. Many excellent charts and statistical tables add interest to this comprehensive report of 68 pages. The last page shows in a table the distribution of the Department of Health personnel of 727 members, exclusive of the 925 employees in the city hospital and the sanatorium, and the 22 sanitary police, on the police pay roll.

A unique and carefully worked out plan of diphtheria prevention is described. In 1928 it was felt that diphtheria prevention had been demonstrated over a sufficient period of time for the majority of people to have confidence in it. Hence, the work was in November, 1928, turned over to the practicing physicians of the city according to a plan worked out by the Public Health Committee of the County Medical Society and the Department of Health and approved by the County Medical Society.

Weekly meetings were held during the year by the Public Health Commit-

tee of the Medical Society, at which time representatives of the Department of Health discussed with the committee points of mutual interest and devised plans for meeting specific problems. An immune serum clinic was developed, where blood was taken from donors who had within one year recovered from scarlet fever, measles, poliomyelitis, meningitis, whooping cough, chicken pox and mumps and the immune serum was prepared for distribution to physicians.

The principal causes of death were heart disease (13.6 deaths per 100,000 population), pneumonia (10.3), tuberculosis (8.0), violence (7.6), early infancy (7.2), and cancer (6.8). A birth rate of 23.5 and an infant mortality rate of 69.4 are noted.

In connection with school health work, the Department of Health, through its staff of school physicians and nurses, attempts to see to it that parents and children alike are properly instructed so as to avail themselves of the help of their own physicians and dentists for these services.

An effort was made to evaluate the work in elementary grades. Examinations of all children in all secondary schools showed that while of all 1st grade children there were 69.7 per cent with defects, in the intermediate group the figure dropped to 46.8 per cent, and in the high schools, to 39 per cent. A health counsellor program was set up by the Board of Education in certain schools under the supervision of a full-time head, who was charged with the guidance of the individual and with the arrangement of the activities of the school itself to help meet the needs of the child.

Newport, R. I.—Newport, R. I., had an estimated population in 1929 of 30,600. The per capita expenditure for health was 71 cents. The staff of the Board of Health consists of a commissioner, clerk, bacteriologist, milk and

sanitary and food inspectors, a school nurse, a part-time oculist and aurist, a part-time chief, 2 assistant dental inspectors, and 4 part-time medical school inspectors. Of 5,539 pupils examined, 617 were found with defects in vision and 149 in hearing. There were 536 pupils registered in the dental clinic, of which 235 received prophylactic treatments and 221 were referred to other dentists. The school nurse made 1,605 visits, as well as assisting in the Dental Clinic and in the eyesight and hearing examinations and with the Schick tests

and treatments in the schools and at the office.

For 11 full years regulations have been enforced permitting the sale of but two classes of milk—certified and pasteurized. This condition has doubtless been a factor in placing Newport among the low infant mortality cities of the country, the 1929 estimated rate being 38.7 per 1,000 births. Only 21 infant deaths from gastroenteric disorders have been reported in the 11 years since enforcement, as against 118 in the 11 previous years.

## BOOKS RECEIVED

- ELEMENTARY MATERIA MEDICA, INCLUDING DRUGS AND SOLUTIONS. A Text-Book for Students of Nursing. Philadelphia: Saunders, 1929. 278 pp. Price, \$1.75.
- A SYSTEM OF BACTERIOLOGY IN RELATION TO MEDICINE. Vol. II. Various authors. London: His Majesty's Stationery Office, 1929. 420 pp. Price, \$6.00.
- INDUSTRIAL HYGIENE FOR SCHOOLS. By Jesse F. Williams and Delbert Oberteuffer. New York: McGraw-Hill, 1930. 280 pp. Price, \$2.00.
- THE NEW EVOLUTION—ZÖÖGENESIS. By Austin H. Clark. Baltimore: Williams & Wilkins, 1930. 297 pp. Price, \$3.00.
- NURSING IN EYE, EAR, NOSE AND THROAT DISEASES. By A. Edward Davis and Beaman Douglass. (3d ed. rev.) Philadelphia: Davis, 1930. 373 pp. Price, \$2.50.
- THE MATERIALS OF LIFE. By T. R. Parsons. New York: Norton, 1930. 288 pp. Price, \$3.00.
- THE SCIENCE OF BIOLOGY. An Introductory Study. By Geo. G. Scott. (Revised and reset.) New York: Crowell, 1930. 633 pp. Price, \$3.75.
- THE BASIS OF EPILEPSY. By Edward A. Tracy. Boston: Badger, 1930. 92 pp. Price, \$2.00.
- HOME NURSING AND CHILD CARE. By C. E. Turner, Nell Josephine Morgan and Georgie B. Collins. New York: Heath, 1930. 282 pp. Price, \$1.20.
- IMPROVE YOUR MEMORY. By Bertrand Lyon. Boston: Lothrop, Lee & Shepard, 1930. 252 pp. Price, \$2.50.
- CHILDREN AT THE CROSSROADS. By Agnes E. Benedict. New York: Commonwealth Fund, 1930. 238 pp. Price, \$1.50.
- ESSENTIALS OF PEDIATRIC NURSING. By Ruth Alice Perkins. Philadelphia: Davis, 1930. 364 pp. Price, \$2.75.
- A STUDY GUIDE TEXT-BOOK IN THE PRINCIPLES AND PRACTICE OF NURSING. By Lulu K. Wolf. New York: Macmillan, 1930. 139 pp. Price, \$.70.
- PRACTICAL PREVENCEPTION OR THE TECHNIQUE OF BIRTH CONTROL. By William J. Robinson. Hoboken: American Biological Society, 1929. 170 pp. Price, \$3.15.
- INFANT NUTRITION. A TEXTBOOK ON INFANT FEEDING FOR STUDENTS AND PRACTITIONERS OF MEDICINE. By W. McKim Marriott. St. Louis: Mosby, 1930. 375 pp. Price, \$5.50.
- IS IT SAFE TO WORK? A STUDY OF INDUSTRIAL ACCIDENTS. By Edison L. Bowers. New York: Houghton Mifflin, 1930. 229 pp. Price, \$2.50.
- SCIENCE IN THE SERVICE OF HEALTH. By Elliott R. Downing. New York: Longmans, Green, 1930. 320 pp. Price, \$2.00.

## NEWS FROM THE FIELD

### HOSPITAL ASSOCIATION MEETING IN NEW ORLEANS

THE American Protestant Hospital Association will convene in New Orleans on October 17, 1930, and will continue in session until October 20, 1930, when the preliminary meetings of the American Hospital Association will begin. They will continue through October 24. The American Occupational Therapy Association, the Hospital Social Workers' Association and the Association of Children's Hospitals will hold their meetings at the same time.

The American Public Health Association meets at Fort Worth, Texas, the following week.

### INFANT MORTALITY RATE HIGHEST IN WASHINGTON

THE National capital has the highest infant death rate in the country—19.2 per 1,000 under 1 day old, as compared with an average of 15 per 1,000—according to Drs. Leon S. Gordon and Oscar B. Hunter, Washington.

They made this statement before the District Medical Society on May 7.

### CLEVELAND ACADEMY OF MEDICINE

THE Academy has embarked upon a career of editorship of a health column in the Cleveland Press. For several years the Committee on Health Education has discussed with the Cleveland newspapers the possibility of furnishing such a column. As an experiment the *Cleveland Press* accepted a series of brief articles on general health subjects now appearing under the heading "Your Health Today" on Mondays, Wednesdays and Fridays.

The column is being supplied by the Committee on Health Education and H.

Van Y. Caldwell, executive secretary. Dr. S. C. Lind has been named as consulting editor, and will work with Mr. Caldwell on the revision of all material submitted.

The members of the committee are: Drs. Lester Taylor, Chairman, R. A. Bolt, A. B. Denison, C. G. LaRocco, S. C. Lind, E. A. Peterson, H. D. Piercy and H. L. Rockwood.

### CANADIAN PEOPLE VALUED AT \$175,000,000,000

VALUATION of the Canadian people as human beings at \$175,000,000,000 was made before a joint meeting of the Canadian Public Health Association and Ontario health officers by R. H. Roats, Dominion statistician. He explained the basis of the estimate by giving the figures of value in the case of a man able to earn \$2,500 a year at the height of his working ability.

At birth, he said, such a man is worth \$9,000; at 15 years, \$25,000, and at 25 years, \$32,000. Value of the female life, he said, was half as much.

"That," he explained, "is the capital value of the asset. It is your professional duty to maintain it at its maximum of efficiency and dividend earning capacity."

### PHILIPPINE UNIVERSITY RECEIVES \$150,000 GIFT

A GIFT of \$150,000 by the Rockefeller Foundation to the University of the Philippines, a State-owned institution in Manila, has been announced by Eugene A. Gilmore, Vice-Governor-General of the Philippine Islands. The fund is for the construction of a building to house the university's graduate school of hygiene and public health.



Mr. Gilmore said the gift was made on condition that the university provide a suitable site and yearly operating budget of \$40,000. These conditions, he said, have been met and the money has been given.

#### INTERNATIONAL ASSOCIATION OF MILK DEALERS

ONE hundred and thirty laboratory directors and workers from the East assembled at Geneva (N. Y.) Agricultural Experiment Station on April 29 to participate in an intensive two-day laboratory clinic.

One of the most interesting discussions was on recent research and discoveries in dairy chemistry with special reference to the caseins of milk. Dr. D. C. Carpenter of the Station led the discussion. He has recently done outstanding work in coöperation with Dr. Svedberg of Sweden.

Dr. R. S. Breed and Dr. A. C. Dahlberg outlined the work that is now in progress at Geneva.

Among the interesting papers was one by A. J. Powers of Borden Company, which discussed standard plate methods. It was shown that sample bottles, sampling procedure and plating technic were not entirely standard although standard ingredients for media had solved numerous media problems.

#### SANITARY SURVEY OF TEXAS STORM AREA

ON May 6, a number of storms developed over Texas with cyclonic intensity. Much damage was done, particularly in a 20-mile strip of 200 yards width, southwest of San Antonio and in similar areas in Central Texas. The City of Frost suffered the worst. This city has a population of 1,100. About 60 of the 200 homes were destroyed.

In all there were 65 deaths, 22 of them being in Frost, and many were injured. A hurried review revealed that the water supply with its sources from

a deep well was considered of satisfactory quality. With no power the pumps were out of commission; this with the broken taps soon emptied the reservoir. Power was restored in 24 hours but pressure could not be maintained because of broken connections. Plumbers were rushed to the locality; samples were tested daily; apparatus for emergency supply of chlorine was made available; and instructions were issued to boil all water.

Because of broken connections, and lack of running water, sewage disposal was considerably retarded, but temporary latrines in the form of pit toilets were installed to take care of the large number of workmen needed in reconstruction, and until regular service could be restored.

Temporary canteens were established with special sanitary inspectors to supervise sanitary measures.

The State Department of Highways took care of the cleaning of streets and disposal of refuse, dead stock, etc.

A temporary clinic was opened under the direction of local health officers with the assistance of the State Health Department and the Red Cross.

Several other areas were reached as quickly as possible with precautionary measures, and instructions were published in all newspapers on the prevention of diseases arising from the storm. —E. G. Eggert, Sanitary Engineer in Charge.

#### NEW JERSEY INDUSTRIAL NURSES

THE Industrial Nurses Club of New Jersey met on May 19 in Newark, N. J. There was a dinner after which there was a round table discussion.

#### NEW LABORATORY CAR

THE Southern Pacific car mentioned in the June *Journal* should have as its personnel a laboratory technician, a doctor, and probably a dentist. The car is of regulation Pullman length and

is beautiful in its interior appointments, being of rather extraordinary mahogany. It has two staterooms with bath between, a compartment, and two compartments for the crew of two, the cook and porter, with their bath and toilet. The car is intended to do periodical physical examinations, especially in inaccessible parts of the Southern Pacific system and endeavor to sell the idea to their men and for their families as well. It will be equipped with movies of an educational type on all subjects of preventive medicine. It will also be equipped with movies for the medical staff of the railroad and it is expected not only to do periodical examinations but will offer immunization against disease for both employees and their families. It has a complete X-ray equipment with its own unit of batteries and gasoline engine. There is a completely equipped darkroom and bacteriological and chemical laboratory. The car will be available for any epidemiological work, especially at the time of any epidemic. There are an observation platform, an observation waiting room which can be turned into a dining room en route, and an examining room for various types of examinations.—Dr. J. C. Geiger (see also *A. J. P. H.*, June, 1930, p. 694).

#### FELLOWSHIPS IN MEDICINE

THE issue of the *Journal of the Association of American Medical Colleges* for January, 1930, contains a list of fellowships, funds and prizes available for graduate work in the United States and Canada. A reprint, which has been made available by the Editor of this *Journal*, should prove of interest to health administrators who are in search of a list of available fellowships.

#### A NEW FOUNDATION

THE Josiah Macy, Jr., Foundation, incorporated in New York State and established through an initial gift

of five million dollars from Mrs. Walter G. Ladd in memory of her father, will devote its income to the support of studies of fundamental aspects of "health, sickness and methods for the relief of suffering."

It will offer aid in form of scholarships, awards, publications and financial grants to promote coöperation with unified aims between universities, colleges, hospitals, laboratories, learned societies and other undertakings of social usefulness.

#### THE HEALTH LIBRARY OF THE CITY HALL

THIRTY books on various phases of public health which ought to form the nucleus of a health library in every city hall are described in some detail in an article in the 1930 *Municipal Index*, published by the *American City Magazine* of New York. This useful bibliography has been prepared by Dr. R. S. Patterson, who edits the "Selected Public Health Bibliography" in the *American Journal of Public Health*, and by Dr. James A. Tobey, who is contributing public health editor of the *American City Magazine*. Health officers will find the suggestions in this article of great value.

#### MATERNITY AND CHILD WELFARE

THE National Conference on Maternity and Child Welfare will be held at the Friends' House, Euston Road, London, on July 1, 2 and 3.

The Presidential Address will be delivered by Susan Lawrence, M.P., Parliamentary Secretary to the Minister of Health. This is the first time since the series of Conferences was inaugurated in 1906 that a woman has played this important, but very appropriate, rôle. Among the Chairmen of the various sessions will be: Sir Arthur Stanley, The Lady Lawrence and Neville Chamberlain.

## PERSONALS

- DR. C. V. MERRITT, for a number of years Health Officer of Flint, Mich., died recently and has been succeeded by Dr. C. J. Scavarda.
- DR. JOHN SUNDWALL, Director of the Department of Hygiene and Public Health of the University of Michigan, will teach at the University of California during the summer session.
- DR. J. J. DURRETT, who resigned his position as chief of drug control, Food and Drug Administration, U. S. Department of Agriculture, to become State Health Officer of Alabama, has returned to the former position.
- W. C. RUCKER, M.D., of the U. S. Public Health Service, New Orleans, died on May 22.
- FRED N. JOHNSON has been named sanitary officer of Cumberland County, Tenn., to succeed W. H. Wright, who recently resigned.
- E. C. STOV, of the U. S. Public Health Service, who has been assigned to work in Tennessee for the past several years, has gone to Florida, where he will work in connection with the Florida State Board of Health.
- DR. MORRIS MASLON was recently re-appointed to the Glens Falls (N. Y.) Board of Health.
- DR. NATHAN M. SPECTOR has been appointed Health Officer of Willimantic, Conn.
- DR. WALTER P. McGRATH has been elected as Health Officer of Menasha, Wis.
- DR. GUSTAV J. HILDEBRAND has been elected Health Officer of Sheboygan, Wis.
- DR. WILLIAM B. HARRISON has resigned his position as Health Officer of Shelby County, Tenn., and is now affiliated with the Tennessee State Department of Health. Dr. Wallace P. Moore, formerly director of the division of epidemiology of the county health department, replaces Dr. Harrison as County Health Officer.
- DR. E. G. SMITH, dental clinician, has been added to the staff of the Tennessee State Department of Public Health. Dr. Smith is in charge of the state dental program, and will make his headquarters for the present in Nashville. Later he is to be assigned to East Tennessee, with headquarters at Knoxville.
- DR. L. M. COULTER was appointed Health Officer of Stanislaus County, Calif.
- M. T. S. WRIGHT is City Health Officer of Dunsmuir, Calif. He succeeds John H. Young.

## CONFERENCES

- August 26-28, Eighth Texas Sanitarians Short School, held with Texas State Department of Health and the City of Amarillo, Amarillo, Tex.
- September 8-12, American Congress of Physical Therapy, St. Louis, Mo.
- September 29, week, National Safety Council, Chicago, Ill.
- October 20-25, American Hospital Association, New Orleans, La.
- October 11-19, National Dairy Exposition, St. Louis, Mo.
- October 22-24, International Association of Dairy and Milk Inspectors, Cleveland, O.
- October 27-30, American Public Health Association, Fort Worth, Tex.

### FOREIGN

- August 3-9, Second International Congress for Sex Research, London, England
- August 4-9, International Veterinary Congress, London, England

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## Significance of Thermophilic Bacteria in Pasteurized Milk\*

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IN discussing this subject we feel that it is best to attempt to answer certain questions which probably exist, or have existed at some time, in the mind of everyone concerned with the control of city milk.

*What are thermophilic bacteria?* It may not be necessary to go into detail, but it is well to define rather exactly what we propose to discuss. We shall include not only the obligate thermophiles which grow only at temperatures above the usual limits of bacterial growth but also the facultative thermophiles which grow normally at ordinary temperatures and are able to multiply at 50° C. or higher.

There are no natural limits for these groups. The obligate thermophiles have a temperature range running as high as 85° C. Some facultative thermophiles grow as low as 20° C. and as high as 60° C. We are interested in those which grow at the usual pasteurizing temperatures and those which are unable to grow at this temperature but grow readily at a few degrees below this point.

The upper thermal limit of the growth of any particular strain of bacteria is much more sharply defined than the lower. Bacteria which are inhibited or destroyed at 145° F. may grow rapidly at 140° F.

The thermo-resistant bacteria which, although they do not form spores, survive pasteurization, should not be confused with the thermophiles. Both groups of bacteria sometimes produce pinpoint colonies on agar plates but otherwise there is no connection between them.

There has been a tendency to look upon the thermophiles as a natural group of related bacteria. On the contrary it is a hetero-

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\* Read at a Joint Session of the Food, Drugs and Nutrition and Public Health Engineering Sections of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 3, 1929.

geneous collection including representatives of many unrelated species. They should be regarded as variants which may occur in any species and which usually differ from the normal only in their ability to grow at high temperatures.

We find among the thermophiles representatives of the streptococci, the lactobacilli, the colon group, anaerobic, and especially aerobic spore-forming rods. The last is the group most commonly found in pasteurized milk.

*What is the source of thermophiles in milk?* They occur naturally under conditions which make it easy to account for their presence in milk. Thermophilic bacteria were first observed in thermal springs where they sometimes grow at temperatures over 80° C. They are known to occur in fermenting manure and other vegetable material. It would probably be possible to isolate thermophiles from almost any sample of cow manure. From these sources they become widely distributed and may be found in soil, dust, on the leaves of plants, and the surface of any exposed material.

Under some conditions the surface of the soil may reach temperatures high enough to favor the growth of thermophiles and it is possible that under some circumstances they may grow in the soil at relatively low temperatures.

We consider it very improbable that bacteria of this type ever actually live in the udder. It is true that milk drawn direct from the udder into test tubes and held at 50 or 55° C. will sometimes reduce litmus, but it does not necessarily follow that this milk is inoculated with thermophiles from the ducts of the udder. Very rigid precautions are necessary positively to exclude outside contamination. However, there are many things beside bacteria which reduce methylene blue and this reaction cannot be accepted as proof of bacterial growth without proper checks.

We have examined the udders of a large number of cows without securing any positive evidence of the presence of thermophilic bacteria. However, it is not necessary to assume that these bacteria grow in the udder to account for their almost universal presence in mixed herd milk. It is probable that almost any sample of mixed milk from the ordinary farm if held at 50–55° C. would show development of thermophiles.

*Under what conditions do thermophiles attain high numbers in pasteurized milk?* There are a number of conditions which may work singly or jointly to produce this result. One is an exceptionally high initial contamination before pasteurization. The milk from some individual farm may come to the pasteurizing plant heavily infected

with thermophiles. This is not common but in one plant investigated it was found that the milk from one farm gave a nearly pure culture of thermophilic bacteria.

The milk may be inoculated before pasteurization by adding to the batch milk returned from the wagons. If, as frequently happens, the end of the previous day's run was high in thermophiles, this may serve as an inoculation for the new run.

The milk may be inoculated from defective equipment, such as leaks which permit milk to stand in the lining of the vat and subsequently, when highly charged with thermophiles, to seep out into the pasteurizer.

The milk may also become infected from the foam and residue left from the previous batch. Thermophiles may also multiply in the pasteurizer when some part of the milk is not maintained at the proper temperature. The reduction of the pasteurizing temperature even a few degrees brings the milk within the growth range of many varieties which cannot grow at 145° F. This may happen in dead ends of pipes, possibly in corners of vats not reached by the agitators, and especially in the foam. It is well known that the foam is several degrees lower in temperature than the milk under it and not only do the more resistant bacteria carried by the foam survive, but it acts as an incubator for many types of thermophilic bacteria.

The most common cause of high thermophilic counts is the building up in numbers when successive batches are pasteurized in the same vat without adequate cleaning between runs. There is some

TABLE I

## INCREASE IN THERMOPHILIC BACTERIA IN PASTEURIZER VATS

Vat No.	Run	Reduction Time at 55° C.		Direct Counts of Streptobacilli	
		Before Past. Hrs.: Min.	After Past. Hrs.: Min.	Before Past.	After Past.
I	1	8:41	8:01	20,000	20,000
	2	6:59	4:38	42,000	345,000
	3	6:09	1:18	121,000	4,500,000
	4	2:58	0:18	1,850,000	22,000,000
II	1	1:57	0:33	1,420,000	15,500,000
	2	2:34	0:48	515,000	8,760,000
	3	6:10 (Neg.)	1:26	30,000	4,850,000
	4	4:21	0:33	970,000	14,000,000
III	1	10:00 (Neg.)	9:54	0	0
	2	2:53	0:31	1,000,000	8,500,000
	3	3:47	0:50	130,000	12,600,000
	4	4:13	0:26	324,000	13,600,000
	5*	4:20 (Neg.)	3:33 (Neg.)	173,000	348,000

\* Milk held in vat for 50 min. at 143° C.

multiplication in the first batch, started by the thermophiles which are almost invariably present in mixed milk. The foam and milk left in the bottom of the vat serve as an inoculation for the following run so that if five or six batches of milk are pasteurized in one vat the later ones are likely to have a high count. In Table I is shown how the bacteria which grow at high temperatures may grow in the vats and build up in numbers by the end of the last run of the day. The experiments were conducted in a large milk plant under normal plant conditions.

An examination of the results in Vat I shows a smooth and regular building up of thermophiles from very few after the first run to 22,000,000 at the end of the fourth. It will be noted that the reduction times correspond very well with the numbers of bacteria.

Vat II is an example of apparently bad contamination with thermophiles before the first run. The vat had evidently not been properly cleaned and scalded before the beginning of the day's run. This heavy initial contamination was reduced to some extent after several successive flushings with vats of milk but had started to build up again by the end of the day as is evidenced by the increase to 14,000,000 at the end of the fourth run.

Vat III shows a building up process for the first four runs of the day when the normal procedure was being carried out in the pasteurization of the milk. At the time of the fifth run, however, there was a break-down in the bottler and the milk had to be held for a longer time at 143° F. before the vat could be drained onto the cooler. In this case the milk was held over 50 minutes at pasteurizing temperature. The result was a marked decrease in the number of high temperature bacteria: from 13,600,000 at the end of the fourth run to 348,000 at the end of the fifth. This would seem to indicate that these particular bacteria were not favored by the pasteurization temperature and when the longer period allowed the foam, splash, etc., to attain a higher temperature their numbers were materially reduced. This is in keeping with results obtained by one of us on thermophilic bacteria from this same milk plant at another time. It was found that the bacteria increased rapidly in the foam which was at a lower temperature than the milk, but decreased rapidly in the milk or in foam brought up to the pasteurizing temperature.

*What does the thermophilic count indicate?* It indicates that one or more of the conditions which we have enumerated exist in the pasteurizing plant. The plant may be receiving unusual contamination; it may be repasteurizing milk brought back from the wagons; the walls of the pasteurizer may have a thin layer of cooked milk in which

thermophiles may grow; the construction of the pasteurizer may be defective so that some of the milk fails to reach the pasteurizing temperature; there may be an excessive amount of foam which is not heated to temperature; or the vats may not be cleaned between runs.

The value of the thermophilic count to the control officer is much the same as the value of the ordinary count. We do not count the bacteria in pasteurized milk because we are especially concerned with the destruction of the particular types of bacteria whose colonies grow on an agar plate. We make these counts because by them we can tell with reasonable certainty whether the milk has been heated to a temperature which will render it free from pathogenic bacteria; whether the plant is operated in a clean and efficient manner; and whether the milk is properly cooled between pasteurization and delivery.

There is no reason to think that the thermophilic bacteria are more harmful in milk than their relatives growing at lower temperatures. In fact since most of them grow very slowly or not at all at low temperatures there is a tendency to regard the thermophilic count as of no significance. Some have even advised to use culture media on which their colonies will not grow and to pretend that they do not exist. This ostrich-like attitude does not appeal to bacteriologists who believe that the plate count should be made to show as correctly and completely as possible the conditions which exist in the milk.

A control officer should welcome a technic which will enable him to detect those pasteurizing plants which are defective and make it possible for milk to leak into the walls of the vat, or which do not heat all of the milk to the required temperature. To be assured that between runs the vats are properly washed and steamed may not be a matter of major importance, but if the omission of this serves to obscure more serious defects it should be corrected.

On the whole we believe that an estimation of the number of thermophiles should be made of real service in the control of pasteurization. However, it is not sufficient to tell a dealer that his milk contains a large number of thermophilic bacteria and that this number must be reduced. Ordinary bacteria are a deep enough mystery for the average milkman. The inspector should be able to point out wherein his methods are defective and how they may be remedied.



# Hygiene of the Towel

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PUBLIC health authorities have expressed an almost universal desire to banish the common towel. In an effort to develop more concrete evidence that might answer the questions listed in this paper, the authors have made the bacteriological and physical studies described after each. Standard size towels were used in the experiments.

*Question 1*—When the hands are washed in the usual manner, are bacteria transferred to the towel in appreciable numbers?

The finger tips were inoculated with a 24-hour broth culture of *Flavobacterium lutescens*, a bright yellow chromogenic bacillus. They were held before an electric fan 15 minutes, drying the skin even beyond its normal condition. The hands were then washed with a toilet soap for 10 seconds, rinsed for 5 seconds to remove the soap, and wiped on a sterile Turkish hand towel. After 30 minutes' drying, the towel was examined for the number of bacteria present. Disks 2" in diameter were cut from the center of the towel and one was placed in 100 c.c. of sterile physiological salt solution. Appropriate dilutions were plated in standard beef extract agar and incubated for 2 days at 37° C. when the number of yellow organisms developed from the 2" disk was determined.

A second disk taken from the same towel was placed on a sterile agar surface for 10 seconds. Upon removal, an impression of the towel and some of the bacteria which had been present were left on the plate, which was also incubated for 2 days at 37° C.

In the case of the Turkish hand towel 48,000 bacteria per 2" disk were removed from the finger tips, while the huck towel removed 15,000; so that in common washing practice, not only are large numbers of bacteria apparently transferred to towels, but, comparatively, Turkish towels remove larger quantities than huck.

*Question 2*—When several individuals use a common towel, may infectious bacteria be transferred from one individual to another?

Three separate investigations were conducted, under both exaggerated and ordinary conditions.

The first series were hand washing tests to show whether bacteria are transferred to subsequent users from original ones.

Individual 1 washed the hands thoroughly with soap and warm water for 1 minute. They were then dried by electric fan. One c.c. of a 24-hour broth culture of *Flavobacterium lutescens* was rubbed over both hands, which were again electrically dried for 15 minutes, and then washed with tap water at about 37° C. and cake toilet soap for 10 seconds; then rinsed for 5 seconds with running tap water and dried thoroughly on a sterile Turkish hand towel. Individual 2 washed his hands thoroughly with soap and warm water for a period of 1 minute, the degree of efficiency of which was determined by finger-printing a nutrient agar plate subsequently incubated at 37° C. for 48 hours. He then dried the hands on the towel which had been used 5 minutes previously by individual 1. After a simple drying of 20 seconds, finger-prints were again taken. The first photograph marked "No. 5 control" (Plate A) indicates a small number of bacteria present after the washing process.

Individual 2 then dried the hands on a towel which had been used 24 hours before by individual 1. After a simple drying of 20 seconds, finger-prints were again taken. The photograph marked "Turkish towel used 24 hours before" shows a much larger number of bacteria than photograph "No. 5 control." Several bright yellow colonies demonstrated a transfer by the towel from individual 1.

Rapid bacterial destruction through desiccation in the absence of nutrient material has been generally postulated. The results of tests by individual 2 after both 5- and 24-hour intervals were somewhat similar to those obtained after the 5-minute interval and indicated duration of viability of bacteria on the towel contamination by individual 1. Small numbers of bacteria died by reason of the longer periods of sojourn on the towel, but a major number remained, ready to contaminate the hands of anyone using the towel the second time.

To compare the action of huck hand towels, this entire series of tests with Turkish hand towels was repeated, using huck towels. A slightly greater number of bacteria were transferred to the hands at the end of the 5- and 24-hour periods (Plate A). This was confirmed in several tests and indicates readier pick-up of bacteria from the flat surfaces of the huck towel than from the rough surface of the Turkish hand towel.

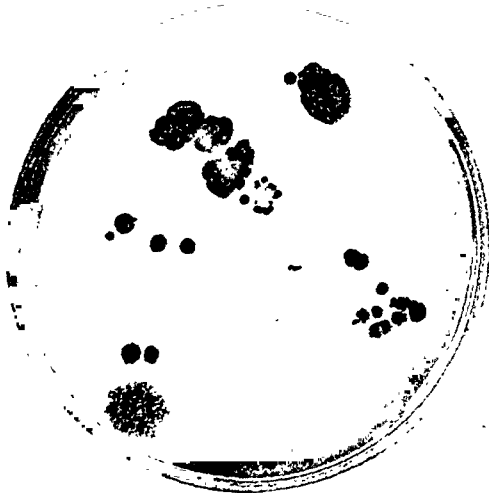
The second series of studies comprised hand washing tests to demonstrate whether or not multiple infections can be transferred to each user of the common towel; i.e., to indicate what is apt to occur when a towel is infected by several people.

## PLATE A

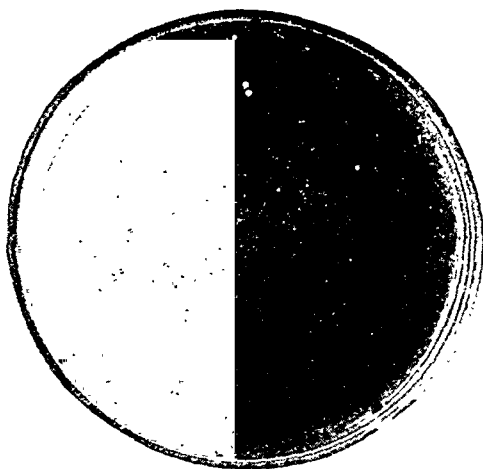
IMPRESSION INOCULATIONS ON AGAR BY FINGER TIPS AFTER WASHING AND RINSING, THEN DRYING ON USED TURKISH HAND TOWEL AND ON USED HUCK TOWEL



1—No. 5 Control, Washed Hands



2—No. 5 Turkish Towel Used 24 Hours Before



3—No. 6 Control, Washed Hands



4—No. 6 Huck Towel Used 24 Hours Before

In this series of studies four individuals participated, employing the same technic. Individual 1 washed his hands thoroughly with soap and warm water for 1 minute, afterward drying them for 15 minutes. One c.c. of a 24-hour broth culture of the bright yellow chromogen *Flavobacterium lutescens* was rubbed over the hands, which were dried as before, then washed with tap water at approximately 37° C. and cake toilet soap for 10 seconds. The hands were then rinsed for 5 seconds and dried on a sterile Turkish hand towel.

Individual 2 repeated the same process with hands inoculated with 1 c.c. of a 48-hour broth culture of the easily distinguishable, red *B. prodigiosus*. Finger-prints on agar plates were made after wiping the hands on the towel infected by individual 1. The plates were incubated for 48 hours at 30° C., when they showed many bright yellow colonies and a still larger number of red colonies, indicating infection of the hands of individual 2 by the organism left on the towel by individual 1.

Individual 3 repeated the same process with hands inoculated with 1 c.c. of a 24-hour broth culture of the light orange *M. aureus*, to distinguish this organism from those used in inoculating the hands of individuals 1 and 2. Finger-prints on agar plates were made after wiping the hands on the towel previously used by individuals 1 and 2. The plates were incubated for 48 hours at 30° C. They showed many bright yellow and red colonies and a still larger number of light orange colonies, indicating that individual 3 had become infected by the organisms left on the towel by individuals 1 and 2.

Individual 4, after thoroughly washing the hands, employed the towel previously used by individuals 1, 2, and 3. After the usual wiping process, finger-prints were made as before. The plates showed the presence of all three organisms, indicating that the hands of individual 4 had become infected with all three organisms left on the towel by the three previous users.

A huck hand towel was used in a further series of tests. The results were identical, except the numbers of bacteria transferred to individuals 2, 3, and 4 were greater.

It was thus clearly indicated that infectious bacteria may be easily transferred in increasing varieties and numbers through the use of the common towel, especially by the huck hand variety.

The next series of studies considered the accumulation of bacteria on the towel when used by different individuals and whether the varieties of bacteria increased when the towel was used by them. Turkish and huck hand towels were used on four occasions by four different individuals as previously described. Imprints were made after one individual had used the towel and again after four had used it, when it was observed to carry decidedly increased numbers of bacteria.

A further series of tests was conducted to show whether an increase in the varieties as well as numbers of bacteria would occur. When one person used the Turkish towel, an average of over ten types of bacteria was found. The same towel after use by four individuals showed an average of over twenty types of bacteria.

The organisms used in the studies thus far, with the exception of *Micrococcus aureus*, would be classifiable as non-pathogenic.

Many have believed that pathogenic bacteria die rapidly through desiccation, even in the absence of sunlight. If infectious organisms such as might find their way to the common towel were capable of remaining alive over periods of 24 or 48 hours, a real danger would be indicated when the ease of transfer as shown in the previous results is considered.

The next series of studies was conducted to determine whether various species of pathogenic organisms would remain alive for periods of 24 and 48 hours. Sterile disks 2" in diameter were inoculated with cultures of the following infectious organisms: *Bacillus typhosus*, *Bacillus paratyphosus* "B," *Bacillus diphtheriae*, *Streptococcus hemolyticus scarlatinae*, *Streptococcus hemolyticus*, *Pneumococcus Type II*. In each case the organisms were grown on a suitable solid culture medium and, to avoid carrying over to the towel any culture medium which might aid the organism in remaining alive, only the surface growth was used. After inoculation, the disks were placed in clay-top Petri dishes at room temperature and subjected only to a north light. At intervals of 24 and 48 hours, disks of each type of towelling were removed and small portions transferred to suitable culture media. After incubation for 48 to 72 hours, macroscopic and microscopic examinations were made.

TABLE I

VIABILITY OF PATHOGENIC MICROÖRGANISMS ON DRY TOWELLING  
(In absence of direct sunlight)

Test Organisms	Alive at end of			
	24 hours		48 hours	
	Turkish	Huck	Turkish	Huck
<i>B. typhosus</i>	+	+	+	+
<i>B. paratyphosus</i> "B"	+	+	+	+
<i>B. diphtheriae</i>	+	+	+	+
<i>Streptococcus hemolyticus scarlatinae</i>	+	+	+	+
<i>Streptococcus hemolyticus</i>	+	+	+	—
<i>Pneumococcus Type II</i>	+	+	—	—

Living infectious organisms of all these varieties were present on both Turkish and huck hand towels for a period of 24 hours. No pneumococcus survived for 48 hours. *Streptococcus hemolyticus* may or may not die under these conditions within 48 hours. Apparently, therefore, real dangers from infectious organisms exist in the common towel for at least 48 hours after primary contamination.

*Question 3*—Will the repeated use for several days by one individual show an accumulation of bacteria on the towel?—what is the sanitary significance of such accumulations?

Studies were conducted to bring out the possible accumulation of

bacteria during the normal home use of the large Turkish towel upon the entire body; the small Turkish towel upon the hands and face; and the huck towel upon the hands and face. Four individuals participated in each of the three series.

#### LARGE TURKISH TOWELS

Twenty-four large Turkish towels were washed, wrapped separately in paper and sterilized in an autoclave. Six of these prepared towels were given to each of four persons, one of which was used but once to dry the entire surface of the body and was returned to its wrapper and the laboratory for testing. The second was used in the same way on each of 2 consecutive days and then wrapped and returned. The third was likewise employed on each of 3 consecutive days and the fourth, fifth and sixth towels were similarly used on 4, 5 and 6 consecutive days respectively. Between times they hung on the bathroom towel racks under normal home conditions. After each period, determinations were made in the laboratory of the accumulated numbers of bacteria on the towels during the several periods covered. Four 2" disks were removed from different parts of the towels. Three disks were placed in 100 c.c. of sterile physiological salt solution and appropriate dilutions were plated separately in standard beef extract broth. The average of the results for the three disks was taken as the bacterial count for each towel used for the given time period. The results appear in Table II.

TABLE II

BACTERIAL COUNTS FROM TWO-INCH DISKS TAKEN FROM LARGE TURKISH TOWELS USED BY ONE INDIVIDUAL ONE BATH A DAY—FOR PERIODS OF ONE TO SIX DAYS

Number of Days Towel Was Used	Individual 1	Individual 2	Individual 3	Individual 4
1	26,500	38,000	700	4,500
2	17,500	180,000	4,700	18,000
3	46,500	110,000	16,000	9,600
4	100,000	410,000	38,000	43,000
5	100,000	300,000	203,000	81,000
6	240,000	310,000	800,000	178,000

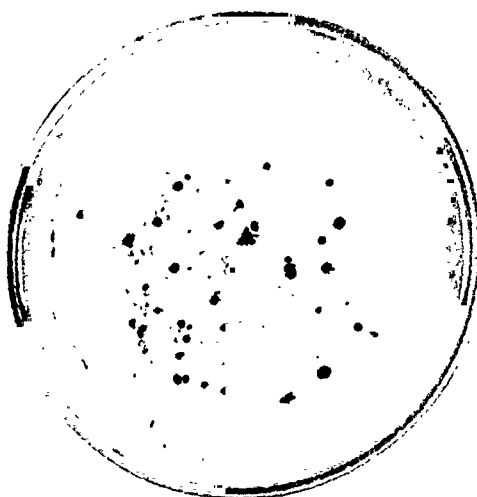
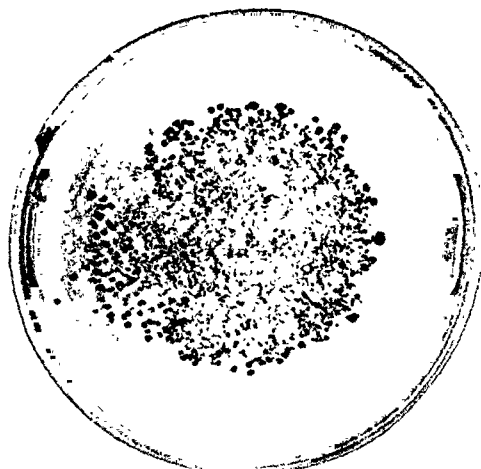
The remaining disk from each of the towels was imprinted on a nutrient agar plate to indicate the distribution of the bacteria on the disk and their increase in numbers. The plates were incubated at 37° C. for 48 hours, and one set including the control was photographed (Plate B).

In each case the imprints indicated a decided increase in the number of bacteria. In the photographs the loose threads or portions of threads may be distinguished readily from the colonies of bacteria.

The results indicate clearly that when a bath towel is used more

## PLATE B

IMPRESSION INOCULATIONS ON AGAR BY DISKS CUT FROM TURKISH BATH TOWEL

1—*Turkish Towel Before Using*2—*Large Turkish Towel Used Once*3—*Large Turkish Towel Used 3 Times*4—*Large Turkish Towel Used 6 Times*

than once bacteria accumulate on it. Variations in results from the towels used by different individuals were remarkably small.

## TURKISH HAND TOWELS

A similar series of tests was conducted by four individuals using a small Turkish hand towel, morning and night, to dry the face and hands, during each of six periods, each period ranging from 1 to 6 days. The results appear in Table III.

The agar plate impressions of the 2" disks taken from the towel used by the four individuals showed approximately the same graphic

TABLE III

AVERAGE BACTERIAL COUNTS ON TWO-INCH DISKS TAKEN FROM TURKISH HAND TOWELS EACH USED BY ONE INDIVIDUAL—MORNING AND NIGHT—FOR A PERIOD OF 1 TO 6 DAYS

Number of Days Towel Was Used	Individual 1		Individual 2		Individual 3		Individual 4	
	Number of times used	Bacterial Counts	Number of times used	Bacterial Counts	Number of times used	Bacterial Counts	Number of times used	Bacterial Counts
1	3	3,800	5	25,500	4	11,500	5	20,500
2	6	9,000	10	55,000	8	9,900	8	48,000
3	10	17,800	15	54,000	12	16,000	13	57,000
4	15	83,000	20	140,000	18	84,000	18	113,000
5	17	70,000	25	143,000	22	180,000	24	95,000
6	20	174,000	30	294,000	28	210,000	30	133,000

results as those obtained in the tests with the Turkish bath towel. The numbers of bacteria were not quite so great but clearly indicated the accumulation and survival of bacteria during different periods of use. Again there were remarkably small variations between individuals for the various time periods.

#### HUCK HAND TOWELS

Another series of tests was conducted exactly as those previously described for the Turkish hand towels. The results are given in Table IV.

TABLE IV

BACTERIAL COUNTS ON TWO-INCH DISKS TAKEN FROM HUCK HAND TOWELS EACH USED BY ONE INDIVIDUAL—MORNING AND NIGHT—FOR A PERIOD OF 1 TO 6 DAYS

Number of Days Towel Was Used	Individual 1		Individual 2		Individual 3		Individual 4	
	Number of times used	Bacterial Counts	Number of times used	Bacterial Counts	Number of times used	Bacterial Counts	Number of times used	Bacterial Counts
1	2	12,500	6	25,500	5	12,500	6	11,000
2	6	27,000	12	60,000	6	48,500	9	18,500
3	9	38,500	15	75,000	9	38,500	16	14,500
4	16	52,000	20	44,500	21	13,000	18	38,000
5	15	44,000	25	150,000	22	56,000	21	6,800
6	17	96,500	30	180,000	24	54,500	28	15,000

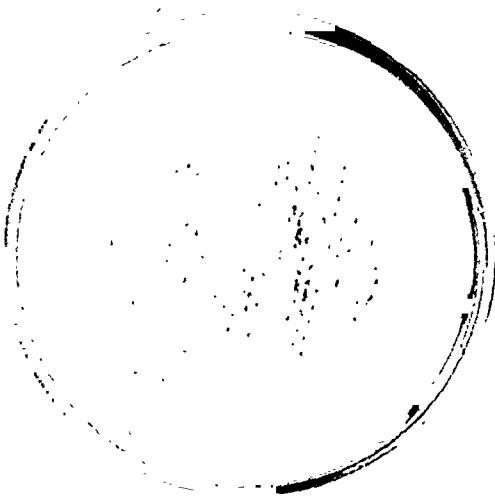
Substantially the same photographic results were obtained from disk tests as in the two preceding studies (Plate C). A comparison of photographs of the huck with those of the small Turkish towel indicated a larger number of organisms in the case of the former. For comparison, averages of the results obtained on the three types of towels by each of the four individuals are given in Table V, which indicates that larger numbers of bacteria were removed and accumulated by both types of Turkish towelling than by the huck towelling.

The results of these tests decisively show the accumulation of bacteria on a towel used more than once by even one individual. If the

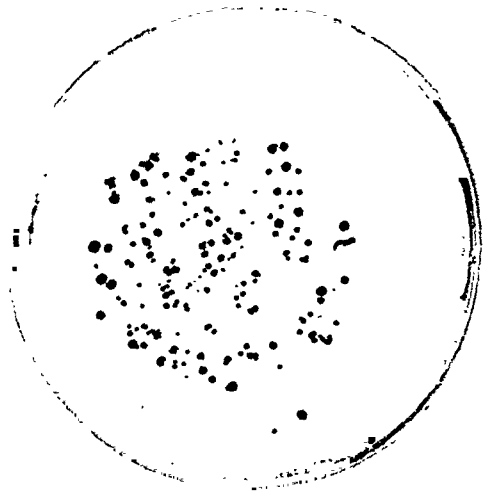


## PLATE C

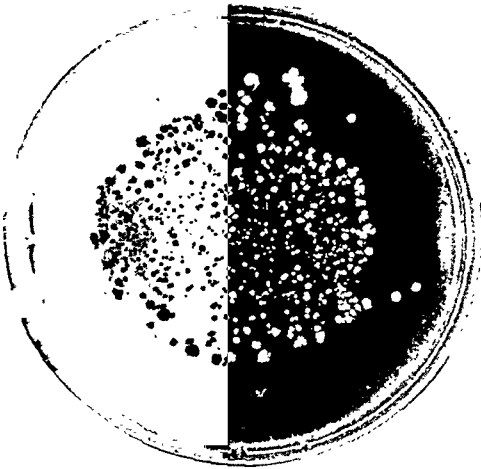
IMPRESSION INOCULATIONS ON AGAR BY DISKS CUT FROM HUCK HAND TOWEL



1—Huck Towel, Before Using



2—Huck Towel, Used 1 Day



3—Huck Towel, Used 3 Days



4—Huck Towel, Used 6 Days

same towel were used by several, similar results should be obtained.

Considering the sanitary significances of such accumulations of bacteria, the results obtained in answering *Question 2* indicate that the individual who uses the same towel on the face, hands or body more than once will not only remove a considerable number of bacteria from the skin but will simultaneously become re-inoculated with the bacteria which he left on the towel previously. The dangers of this practice might be illustrated by an individual who with hands which had become accidentally contaminated with typhoid bacilli washes them ineffectively and dries them on the towel. With the

TABLE V

AVERAGE BACTERIAL COUNTS ON TWO-INCH DISKS TAKEN FROM TURKISH BATH TOWELS, TURKISH HAND TOWELS, AND HUCK HAND TOWELS

Number of Days Towels Were Used	Turkish Bath Towel	Turkish Hand Towel	Huck Hand Towel
1	17,400	15,200	15,300
2	54,500	30,400	36,000
3	70,000	36,400	42,800
4	148,000	105,000	36,500
5	171,000	122,000	64,200
6	382,000	202,000	61,500

next use of the towel, perhaps hours or days later, the hands would re-acquire some of the bacilli which had been previously transferred to the towel and the possibility of infection of food or anything entering the mouth would be substantially as great as at the time of the original contaminations. The numbers of typhoid bacilli would likely be smaller but the opportunity for infection would remain.

In view of these studies, the use of the individual towel more than once must be considered as potentially menacing, and its repeated use, especially over periods of days, should be avoided.

*Question 4*—Which of the three types of towels—Turkish, huck, and paper—will prove most efficient in the removal of bacteria from the skin?

The results of the foregoing studies have clearly shown the towel as an important factor in removing bacteria from the skin. The selection of the type of towel capable of removing the largest numbers of organisms from the skin therefore becomes important as a sanitary measure. To this end, determinations were made of the numbers of bacteria remaining on the skin after the use of Turkish, huck, and paper types of hand towelling.

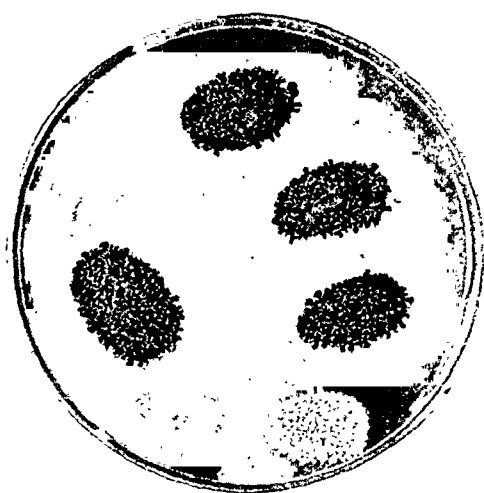
The technic employed was identical with that in the first series of tests to answer *Question 2*. Four individuals participated. Finger-prints before washing showed substantial numbers of organisms and photographs of such control finger-prints show the results from the unwashed hands. During the actual testing, no finger-prints of the unwashed hands could be made, as this would have removed sufficient numbers of bacteria to vitiate the results (Plate D).

After washing the hands, each individual used a Turkish hand towel, the huck, and the paper hand towel in successive tests. When the hands were dried, imprints on agar plates were made and the latter incubated for 48 hours at 37° C.

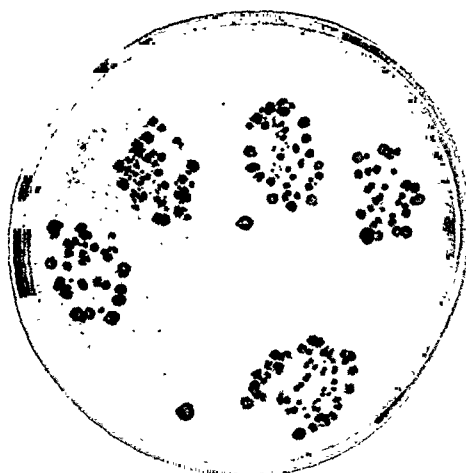
Photographs of the finger-prints of one individual demonstrate the differences found. These are representative of the results obtained from the tests on all four individuals. They indicate that smaller

## PLATE D

## IMPRESSION INOCULATIONS ON AGAR BY INOCULATED FINGER TIPS



1—Inoculated Hands, Before Washing

2—Inoculated Hands, After Washing.  
*Turkish Towel Used*3—Inoculated Hands, After Washing.  
*Huck Towel Used*4—Inoculated Hands, After Washing.  
*Paper Towel Used*

numbers of bacteria remained on the hands when using the Turkish hand towel than with the huck hand towel. Substantiating the previous studies, the largest number of organisms remained on the hands when the paper towel was used, which was to have been expected, since one usually blots with a paper towel rather than rubs the skin dry (Plate D). A definite guide is thus afforded indicating the Turkish towel as more efficient with one using than either the huck or the paper towel. The paper towel is employed but once, the others should be used but once also.

*Question 5*—Which of the three types of towels—Turkish, huck, or paper—will be most efficient in removing visible dirt from the skin?

From observation and comparison of the three types of towelling, the Turkish, having a loose, flexible thread with a rough yet pliable exterior and therefore an increased surface for contact with the skin, should be able to remove from the uneven surface of the hands a larger amount of visible dirt than the huck, and still more than the paper towel. To help demonstrate the difference between the action of the several types of towelling, exaggerated conditions of dirty skin were produced in the first of a series of tests by rubbing, with a little water, 0.1 gm. of lamp black onto the hands. After it had dried for 15 minutes, they were washed as usual for 10 seconds with cake soap and water. After rinsing for 5 seconds they were dried on the Turkish hand towel. Observations of hands and towel were recorded. The day following, the same tests were made by four individuals using the huck hand towel and repeated the next day using paper towels.

The superiority of the Turkish type of towel was again evidenced since larger amounts of lamp black were retained by it than by the huck and much more than by the paper towel, while the skin of the Turkish towel user was cleaner than that of those who used either of the others.

Because so substantial an amount of lamp black had been used in the first tests, they were repeated with as small quantities of lamp black as 0.01 and 0.002 gm. Little difference could be observed in the appearance of the towels as between the Turkish and huck varieties, but again the hands of each individual were cleaner where the Turkish type had been employed. Although crude, this series of tests demonstrates that the Turkish hand towel is superior to the huck or paper type in removing foreign matter from the skin. Single service hand towels, preferably of the Turkish type, give the cleanest appearing hands.

#### SUMMARY

The results of the investigation show some of the effects of the use or misuse of towels and the important part towels may play in the spread of bacteria which may be of disease producing types.

Although public health officials have recognized that the skin, especially that of the hands, may be one of the most important modes of transfer of disease producing organisms, and that diseases other than those of known bacterial origin may also be readily carried by the same means, the part played by the misuse of towels and the relative merits of types of towels have not received so much attention. Tests to secure evidence regarding these points indicate that:

Bacteria are transferred from the hands to the towel in surprisingly large numbers.

Bacteria are readily transferred from one user to another through the medium of the towel.

Most of the common disease producing bacteria, even though in a dry state, may remain alive on the towel for at least 24 hours and generally longer, making the common towel a constant and continued source of danger.

When the towel is used repeatedly by the same individual the numbers of bacteria on and in it are increased and some of these in turn may be restored to the hands of the user. Potential danger exists of a possible re-infection of the hands with disease producing organisms left on the towel by prior use. Repeated drying with an individual towel is not a good sanitary practice.

The Turkish towel, owing to its construction and a consequently greater number of points of contact with the skin, removes greater numbers of bacteria and dirt particles from the skin than the huck towel or the paper towel.

### CONCLUSIONS

The common towel in public or in the home is an ever present menace as a potential carrier of disease producing organisms which thus may be easily transferred to the hands of each new user.

Whether for drying the face, hands, or entire body, the employment of an individual single service towel constitutes a wise precaution against excessive numbers of relatively harmless or of disease producing contaminations by bacteria already on previously used towels.

The Turkish towel is more efficient than the huck or the paper towel in removing bacteria and dirt from the skin.

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## Most Automobile Accidents Due to Law Violation

CAREFULLY compiled statistics in California show that traffic laws have been violated in connection with 60 per cent of the fatal automobile accidents in that state and that inexperienced drivers are involved in about 80 per cent of all fatal motor mishaps. These facts give a very practicable basis for launching a definite campaign against highway accidents that offers hope for a long time overdue improvement in the accident rate.

In California a system of recording accidents and law violations has been adopted. This includes the name of the drivers involved. When three charges are found against the same individual within a 6-months period, the individual is required to undergo a special examination to determine his competency as a driver. In view of the statistical evidence cited above the California system, if prosecuted vigorously, ought to bring about a significant improvement in the automobile accident situation.

# Problems in Public Health Administration\*

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TO casual observation, the creation of a special section for health officers in the American Public Health Association must seem somewhat unusual, in view of the fact that this Association was conceived and brought into being primarily by and for health officers. However, a moment's reflection will make clear that this apparently paradoxical situation is after all a very natural outcome of growth and progress. With the development of the various special activities that have been adopted into standard modern health department practice, it was inevitable that these various specialties would seek and secure a separate place in the organization where their particular problems could be discussed by fellow craftsmen.

After all, though the members of this Association are all devoted to the same general interest—that of promoting the public health—the particular interests of the various groups are not quite the same, nor do they even speak the same technical language. Separation into groups of specialties was therefore unavoidable, and also desirable for the development of the Association and the advancement of its work.

In the evolution of modern public health service, the health officer finds himself little by little further separated from activities which he formerly undertook personally. Gradually he ceases to be diagnostician, registrar of vital statistics, quarantine officer, milk inspector, and sanitary police officer all in one. The fact is that the general practitioner in public health, as in the practice of medicine, is rapidly going out of fashion; and in his place a new type of health officer appears—one who no longer attempts to be a clinician, sanitary inspector, etc., but who, in conformity with the demands of a larger and modernized service, is first and foremost an organizer and administrator.

This does not mean that the health officer surrenders his interest in any one of the various activities represented in modern health work. On the contrary, he must have intimate knowledge of all these matters

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\* Read before the Health Officers Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 1, 1929.

in order that he may properly evaluate their importance and competently direct the development of the service of which he is the responsible chief.

However, what must be realized and understood is that public health, fortunately, is emerging out of the one-man type of service and in place thereof service through organization or group practice has come into being. Just as in the practice of medicine we have come to appreciate that no one man can hope to be fully familiar and equally efficient in all the various specialties into which medical knowledge has extended, so too in the various activities of public health no one man can expect to be equally competent, even if he were physically able to undertake all of the work required in modern service. Public health therefore functions through specialists in its various activities.

Although a number of health departments for many years have been organized and functioning under this enlarged and modern service plan, it would appear from the papers annually read by the health officers at the meetings of this Association that they have not yet awakened to the fact that their service has changed, and their relationship to that service calls for a consideration of new and special problems that are peculiarly and specifically their responsibility.

Why should the health officer undertake to present papers on problems in epidemiology, vital statistics, and child welfare, or any one of the specialties, when he has in his organization those who are presumably expert in these matters and who can handle these subjects with at least equal competency? The explanation is, of course, that we have not apparently realized that we have new and very important responsibilities as administrators, and are still following the traditional practice of the past.

It is most stimulating and promising to find a special place given in the present program at which health officers are to discuss problems that are essentially of an administrative nature.

In a general way, the special responsibilities of the health officer may be classified under four major groupings:

1. Those that have to do immediately with the organization and management of the service as a department activity.
2. Those that deal with the department in its relation to other branches of government.
3. Those that establish coöperation and deal with voluntary health agencies.
4. Those that affect the relationship of the public in general and its special organized groups such as the medical societies, parent-teacher associations, etc.

It is obviously beyond the scope of this paper to discuss every one of these service relationships even superficially. I propose to deal

only with the first group of administrative problems in the above list—those that deal with what may be called “internal affairs,” and with only a few of these.

This Association, through its Committee on Administrative Practice, has furnished the health officer in the *Appraisal Form* a valuable guide for the development of his service.

*Bulletin 164*, on Municipal Health Department Practice, published by the U. S. Public Health Service, *Community Health Organization*, edited by Professor Hiscock, and the record forms for municipal public health service worked out by another committee of this Association are, of course, familiar to you as useful references and aids in the organization and development of service. However, organization and service depend ultimately on the human equation, and propose such problems as competent and qualified workers, hours of service, compensation, sick leave, disciplinary action, housing, budgets, etc.

What is the practice and experience of health officers in building up and maintaining competent and smoothly functioning health machinery? In order to obtain information on this point, a questionnaire was sent last summer (1929) to health officers of various cities having a population of 200,000 or more. To get as comprehensive a picture as possible, the cities were selected so that every section of the country would be represented.\*

The 8-hour day seems to be favored for health department service: 11 out of the 22 cities require that number of hours, 7 only 7 hours, and 2 require 7½ and 8½ hours respectively. Medical service is essentially on a part-time basis, 18 cities reporting it on that basis.

The question dealing with the procedure to determine the qualification and fitness of the applicant for service was answered by 18 of the cities as follows: in 6 the health officer decides; in 1 the health officer passes on physicians and nurses only and the civil service board on all others; in the majority, 10, the matter is handled by civil service; and in 1 city the health officer “suggests qualifications to the civil service board.”

The matter of physical fitness of the applicant appears still very unsatisfactory, and this is rather disappointing in view of the fact that health departments are preaching periodic health examinations as an important factor toward health and efficiency. Of the 19 cities which replied to the question, 12 required no such examination; 5 required it, and 2 required examinations for nurses only. In 3 cities the physical examinations are undertaken by the civil service board; in 2 by

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\* Answers were received from 22 cities: Atlanta, Baltimore, Buffalo, Chicago, Cleveland, Cincinnati, Denver, Detroit, Kansas City, Los Angeles, Louisville, Nashville, New Haven, Newark, New York, Milwaukee, Minneapolis, Portland, St. Louis, San Antonio, San Francisco and Seattle.



the health department, and in 1 of these at the request of the civil service board. In 1 other the health officer is the examining physician.

The question obviously arises—Should not health departments practice what they preach? Should they not prevail upon civil service to make physical competence a fundamental requirement and so protect the public service, and also help the individual to learn of physical handicaps and assist in their correction? Manifestly an examination cannot fully determine the applicant's fitness for service. Time alone will tell.

Twenty-one replies were received to the question—Is there a probationary period, and if so, how long? One city allows a 30-day period; another 2 months; 5 place the period at 3 months. Six months is the time fixed for nurses only in 1 city. Eight others require a 6-month probationary period for all health department employees, and 5 require no probation.

The question as to disciplinary control was answered by 19 of the 22 departments replying. Seven stated that suspension from service was discretionary with the health officer; 3 that it may be undertaken through civil service only. In 1 this authority is entirely in the hands of a board of public safety, while in 3, such disciplinary measures are frankly political, since in 1 this action rests with the mayor and in 2 the city council handles the matter.

Unless suspension carries with it monetary loss, or repetition automatically leads to discharge, it is a meaningless procedure and equivalent to a vacation with pay. In 1 city suspension for 90 days without pay is permissible, in 4 others it is practiced for a period not to exceed 30 days.

Practice with regard to complete and permanent separation from service brought answers from 12 departments. Six stated that action for discharge from service was effected through civil service; 2 did so through the board of public welfare or public safety, of which the health department is a part; in 3 this authority is in the hands of the health officer; and in 1 it rests with the mayor. Appeal from a discharge action was reported in 6 cities through civil service; 1 dealt with it through the mayor; and 1 through common council. One health officer reports that appeal is provided for veterans only.

While management unquestionably succeeds best when it secures the whole hearted and good will coöperation of employees, manifestly insubordination, laziness, disinterest and inefficiency cannot be tolerated. The authority of the department and bureau chiefs must be respected. If minor infractions of discipline cannot be adjusted by

the bureau chief, the department should have authority to suspend without pay for a limited period of time. Repetition of the offense should lead to dismissal through the civil service.

The question of vacation is important, since it involves curtailment in service. Obviously the time for vacations should be so adjusted that the service will suffer least. All but one of the 22 cities replying stated that the authority to fix the time for vacations rests with the health officer. The length of vacation varies from 12 days for clerks and inspectors to 24 for the technical and professional groups. Twelve answers stated that holidays are included in the time allowed; and 10 that they are not.

The practice of granting vacation to employees who have been in service for less than 1 year varies considerably. In 8 cities no vacation is granted to such employees; 2 grant them but do not give the detail of practice. In 1 the health officer decides; in others an allowance of from 1 to 2 days per month of service is made.

Sick leave with pay is not granted in 2 of the 22 cities; 1 allows 30 days; 1, 29 days; 2 others, 10 and 15 respectively; 4, 14 days; 2 state it as "two weeks"; one, "1 week per year of service"; 3 say "conditional," without stating what these conditions are. One allows 75 per cent of the salary for 12 days and 50 per cent for 24 days; another leaves the matter to the discretion of the health officer.

In 14 of the cities, employees are eligible to compensation insurance if injured in line of duty; 7 have no such provision; and 1 did not answer.

Old age retirement is provided for by 11 cities only. The age limit varies from 60 to 70 years, with qualifications in some. Three permit retirement after 25 years of service, while only 4 stated that a pension was given.

The matter of adequate compensation is always an important one, since it is the means of securing and holding competent service. Shall the health officer have a voice in determining what the compensation in his department shall be? Answers were received from 19 health officers. It appears that in the majority of instances the health officer is consulted about the salaries. In 8 cities this matter is in the hands of the health officer, but no details were given. In 7 departments out of 20, salaries are on a graded scale. In 1 city only the salaries paid to nurses and inspectors are graded. The practice in the remaining 12 leaves the matter of increase to the mayor, the council or special boards, and 1 to "pull."

Manifestly the various points mentioned so far by no means represent the sum total of administrative problems, even in so far only as

these have to do with the internal affairs of the department. Organization, housing, budgets, service routine—especially as this has to do with requisitions for supplies and equipment—staff conferences, etc., are all important matters. Then, as already mentioned, there are the special problems that have to do with the department's relationship to government, to volunteer health agencies, the medical profession, and the public in general.

What has been presented must make it clear that there exists considerable diversity of practice and that there is quite definitely room for improvement.

No attempt has been made here to lay down categorically rules for administrative procedure. There is no doubt, however, that further study of administration methods now in practice will prove useful for the improvement of departmental efficiency, and helpful to the administrator in discharge of his duties.

Public health administration is a specialty which, if it is to take and maintain its position along with other public services, must adopt modern methods of business.

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## The Teaching of Bacteriology and Public Health to Hospital Nurses

HOSPITAL nurses should come to graduation with a practical knowledge of bacteriology, epidemiology and public health. Too often their instructors are technicians or members of the hospital staff years removed from the subject, or staff nurses selected because of their inadaptability for other duties. It is perfectly true that prescribed courses are mentioned in the curriculum for hospital nurses but it is not infrequent that the course in bacteriology, at least, is given without the student obtaining actual laboratory experience.

It is likewise true that hospital nurses are not intended to be bacteriologists but their varied duties are such that sterile technic at the bedside and in the operating room is dependent upon existing bacteriologic flora and a workable knowledge of the reasons for possible contamination and the contaminants is necessary. Just as necessary are the fundamentals of the epidemiology and public health measures to be used to combat disease.

The nurse is quite frequently the confidante and companion of the patient and the understanding of questions with their proper answers is equally as important as is sympathy and bedside care. Superintendents of hospitals should carefully scrutinize such instruction in order that the graduate nurse will have some adequate familiarity with laboratory technic and public health procedures.—J. C. Geiger, University of California.

# Report of Visits to Local Registrars of Vital Statistics in Maryland\*

JOHN COLLINSON, M. D., DR. P. H., F. A. P. H. A.

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THE system of registration of births and deaths operating in Maryland is that recommended by the U. S. Bureau of the Census. This was adopted in 1912, and is as follows:

The 23 counties of the state, having a population of 800,000 and an area of 9,933 square miles, are divided into 201 registration districts with a local and deputy local registrar in each. These are held responsible for the complete and accurate registration of births and deaths in their respective districts. Their detailed duties are to receive original birth and death certificates, issue burial and transportation permits, keep records of all certificates received and permits issued, and to acknowledge receipt of birth certificates on post cards supplied. Before the 5th of each month the local registrars forward to the state registrar all original certificates of birth and death which they and their deputies have received during the previous month. For these services the county pays the registrar 35 cents for each original certificate recorded. Applicants pay 25 cents each for burial permits issued upon transit permits, and for disinterment permits issued to them.

The City of Baltimore, which includes approximately half the population of Maryland, comprises one registration district. The registration and preservation of certificates in this district are under the direction of the Health Commissioner of the city. This discussion, therefore, does not include Baltimore.

For the purpose of becoming personally acquainted with the registrars and their work, and of arousing their interest in the activities of the Bureau of Vital Statistics, 121 local registrars, whose districts are scattered generally over the state, were visited during the period April 1 to September 15, of this year. Each was closely and systematically questioned and notes were made regarding

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\* Read before the Vital Statistics Section of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 3, 1929.

1. His profession
2. His familiarity with the duties of his position
3. Whether the necessary office records were being kept
4. The difficulties experienced in obtaining complete reports from physicians, midwives, undertakers, and sextons respectively
5. Checks used to determine the completeness of registration in his district

The summary of findings is as follows:

1. Those who have some clerical work as their regular duty, such as bank clerks, postmasters, and store keepers, make the best registrars. Farmers, physicians, and undertakers are, as a rule, undesirable. An old resident, familiar with the district and its people, is usually preferred to one who has recently settled in the community.

2. Registrars were found to have a working knowledge of the law pertaining to their duties, except that section concerning the issuing of burial permits on presentation of the transit permits which usually accompany bodies brought into Maryland.

3. Office records of birth and death certificates received and of burial permits issued were found to be complete and neatly recorded.

4. In the opinion of registrars, physicians are more negligent in reporting births than licensed midwives. Unlicensed midwives frequently do not report in order to escape prosecution for practicing. It was stated that some undertakers obtain burial permits from the most conveniently located registrars, instead of from the registrar of the district in which the death occurred. The Maryland law states that sextons shall return all burial permits to the local registrar of the district in which the burial takes place. This is not strictly complied with.

5. Probably the most important part of the inquiry was that dealing with the checks used by registrars and efforts made to insure complete registration of births, deaths and burials.

Registrars of small rural communities stated with assurance that they hear through neighborhood gossip of all births which occur in their districts. Registrars of towns of 5,000 and over do not hear of all births and know of no practical way of determining the completeness of registration. Settlements of negroes and communities of foreigners add to the difficulties of local registrars, as in these groups a member of the family who does not know the importance of reporting frequently officiates at the birth.

A few registrars telephone physicians each month, asking that all births attended be reported. Some periodically make the same inquiry of midwives, but these are the exception. All report violations or suspected violations of the law to the State Registrar, if they are known to have occurred and cannot be corrected locally.

The occurrence of a death even in a large community is heard of by the registrar, and the penalty for not properly recording it is generally understood.

The law requiring the return of burial permits to local registrars

does not operate as a satisfactory check on interments, as frequently sextons neglect this duty, and many farms have private cemeteries with no person in active charge.

In conclusion, as recent visits to local registrars have promoted better coöperation and understanding, it is believed that the central office and local health officers should always keep in close touch with representatives in the districts by frequent visits and correspondence.

The present system of the collection of vital statistics in Maryland is operating satisfactorily. It is inferred from reports that death certificates are received and burial permits issued for more than 99 per cent of the deaths which occur, stillbirths excepted.

Taking the state as a whole, Baltimore City excluded, the registration of births was 96.1 per cent complete in 1928, as judged by checking certificates of deaths of infants who died under 1 year against birth certificates to determine if the birth had been reported. There are districts, however, in which there is more than a suspicion that birth reporting is deficient. The evidence collected would indicate that local registrars can do little more to remedy the matter than they are now doing. They consider their position an honor, the duties of their office a serious responsibility, and demand compliance with the law. Success in obtaining complete registration of births and deaths, therefore, as in other fields of public health, must depend on our ability to convince the public of its necessity and value.

## DISCUSSION

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THE conditions in Maryland are very similar to those in Alabama. There are, of course, differences as to details, but the problems for the most part are the same.

During the past three summers Alabama has had three or four students, usually medical, doing field work in vital statistics. They have visited registrars, undertakers, coffin dealers and doctors. The following facts were found, and comparison with the findings of Dr. Collinson is interesting:

1. Of the 159 registrars visited this summer, 61 per cent were men and 39 per cent women—33 per cent were farmers, 28 per cent housewives and 39 per cent had other occupations. We have also found that clerical workers make perhaps the best registrars and for this reason have linked up registration with justices of the peace in the various sub-divisions of the county with good results.

2. This is the first definite field work among registrars carried out, and we

found that many registrars as well as undertakers and coffin dealers sadly needed the instruction made possible by these field visits.

3. We found that the registrars were keeping very accurate and complete records of the births and deaths passing through their hands, 95 per cent of them keeping them as required by law. The question of returning the burial permit to the local registrar has been a difficult one in Alabama. The sextons, with the exception of those in cemeteries located in the towns—and not even in all of these—do not carry out this part of the law. As a result our circuit is not entirely closed and I regret to say that for probably not more than 75 per cent of all deaths in the state are burial permits actually secured before burial.

TABULATION OF VISITS TO ALABAMA REGISTRARS BY FIELD MEN

No. Registrars visited .....	159
No. Counties included in these visits .....	14
Average no. days spent in these counties * .....	10
Time of visits .....	June 1 to Sept. 15, 1929

	No.	Per cent
Men registrars	97	61
Women registrars	62	39
Registrars who are farmers	53	33
Registrars who are housewives	45	28
Those of other occupations	61	39
Registrars having deputies	83	52
Registrars with registry of midwives	91	57
Registrars keeping record of births and deaths	152	95
Registrars issuing permits before burial	75	45
Registrars sending in properly filled out certificates	122	76
Registrars sending in confidential reports	62	39
Registrars having more than one beat	26	16

\* Includes time spent in visits to all coffin dealers, undertakers and doctors in counties.

## Infant Mortality in Latin America

IN the registration area of the United States, the infant mortality rate was 65 in 1927 whereas in the countries of Latin America the lowest rate is about 110; between 110 and 115 in Uruguay and between 110 and 112 in Argentina. In other parts of Latin America it is much higher. For instance, in Brazil, where infant mortality figures are available for some cities, only 2 in the last few years showed an infant mortality rate of 150 to 170; and in Porto Alegre the rate was 292 in 1925.

The medical and social causes of infant mortality are discussed, and the need of a central government agency for maternity and child welfare is emphasized. References are frequently made to conditions in the United States.—*La Mortalidad Infantil en Algunos Países de la América del Sur*, by Dr. Gregoric Aráoz Alfaro, honorary professor of medicine at the University of Buenos Aires and former president of the National Department of Health of Argentina, *Boletín de la Unión Panamericana*, Washington, May, 1930, pp. 505–523.

# Elusive Features in the Epidemiology of the Common Cold \*

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THE common cold is of such frequent occurrence that our opportunities for observing it would seem to be unlimited; yet we have accumulated exceedingly little exact knowledge and less understanding of its epidemiology. We know, in a general way, that it is of world-wide and common occurrence; but we have very scant records of its actual prevalence and distribution in the different elements of any population, still less of its relative prevalence in different parts of the world and in different periods of time.

As to etiology, it is generally believed that the malady is an infection, directly transmissible from person to person, and that certain special circumstances, such as chilling and fatigue, are contributory factors of some importance. These beliefs, however, are based largely upon impressions or so-called common knowledge; they are held somewhat tentatively; and are rather vaguely defined with respect to the nature of the infection—whether it be specific or heterogeneous, primary or secondary—and in the relative importance attached to supposed contributory causes.

In explanation of this backward state of knowledge, there are several features of the common cold which tend to make the collection and interpretation of significant epidemiological data unusually difficult. In the first place, the disease is of such trivial character that, until recent years, it has attracted little serious study except from the angle of bacteriology. Also, because of this triviality, exact records of its prevalence, distribution and clinical course are not obtainable except by elaborate arrangements for special observation of selected groups. Again, the high prevalence of the disease, together with the fact that it causes such slight disability, makes it exceedingly difficult to obtain reliable accounts of the contact relations between cases and even more difficult to interpret such records after they have been collected.

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\* Read at a Joint Session of the Laboratory and Epidemiology Sections of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 4, 1929.



Then too, the fact that colds usually recur in the same person at intervals of a few months necessitates keeping the same individuals under continuous observation for rather long periods; and moreover, whatever interpretation be placed upon this tendency to recurrence, it implies complexities of epidemiology. However, the most baffling features of the disease are (1) that it lacks sharp clinical definition, and (2) that experimental research has yielded only indecisive results.

Referring first to bacteriological and other experimental investigations, they have been so extensive and varied that many different shadings of interpretation may be given to the findings. It is, however, a reasonably fair summary to say that the results to date leave it in doubt whether the pathological reaction which we call a cold is caused by (1) a specific infection, the same in all cases; (2) infection by any one of various organisms; or (3) some non-infectious process which opens the way for bacterial invasion as a secondary phenomenon. If any more definite general result may be claimed, it is, perhaps, that the trend of recent work has been to strengthen the evidence in favor of infection as the primary process; to indicate that none of the easily cultivated organisms commonly found in the respiratory passages bears a specific relation to the disease; and to point toward a filter-passing organism or group of organisms as the primary and essential cause. These, however, are only suggestive indications, not established conclusions.

The lack of positive aid from the bacteriological laboratory constitutes by itself a sufficiently serious difficulty in the epidemiological study of any supposedly infectious disease; but in the problem of the common cold this deficiency is associated with a lack of clinical definition. The fundamental importance of this is indicated by recalling the general process whereby proof of specific etiology is established.

In the usual order of procedure, the first stage in such proof is recognition of a distinctive clinical-pathological process which serves to identify individual cases with each other and to differentiate them from other diseases. It is the distinctiveness of this reaction which establishes the presumption that the cases manifesting it are due to a common cause which is different from that operative in cases where this clinical reaction is not found; and this presumption of specific (not necessarily infectious) causation is of fundamental importance to further investigation, forming a definite foundation upon which to assemble facts pertaining to the nature of the cause. Moreover, the character of the clinical reaction frequently suggests, by analogy with other diseases, that it either is or is not due to a specific microorganism.

In seeking to test the hypothesis of a specific cause and to learn

something of its nature and the mechanism of its action, we proceed by either or both of two methods: (1) by observation and analysis of special circumstances associated with the natural occurrence of the disease; or (2) by experimental methods, including in this category bacteriological and immunological procedures.

These several stages of proof may proceed coincidentally, or their order may be reversed, so that clinical differentiation may be derived originally from bacteriological observation, as in the distinction between typhoid and paratyphoid fever. But regardless of the sequence, the significance of both epidemiological and experimental evidence, as indicating a specific etiology for the disease in question, depends upon the distinctiveness of the pathological process which constitutes the disease. Obviously it is essential to the proof of specific etiology that the effect as well as the cause be specific.

As regards the common cold, what seems to be the most fundamental difficulty is that we have been unable to identify a clinical-pathological process which is sufficiently distinctive to be confidently accepted as specific. This affects both experimental and epidemiological studies. For example, various observers have succeeded in reproducing, under experimental conditions, reactions which more or less resembled the common cold or influenza, but the experiments have been indecisive because of uncertainty as to whether the experimental disease actually was identical with that occurring naturally in man. For epidemiological investigation a primary requirement is to mark off for study a clinical unit so distinctive as to justify the presumption that it coincides with an etiological unit.

In attempting to locate such a unit, we may begin by excluding from consideration diseases such as measles and the pollen fevers which exhibit symptoms more or less resembling those of the common cold but with other characteristics which readily differentiate them. This leaves in the field a rather large family of what we may call the minor respiratory diseases, all characterized by acute catarrhal inflammation of some portion of the respiratory tract, and a constitutional reaction of moderate severity, manifested by such symptoms as general malaise, headache, aching in the body and limbs, and perhaps fever. In addition to what usually would be called "colds," this family includes cases which, by present usage, are variously designated as influenza, grippe, acute bronchitis, tracheitis, laryngitis, and pharyngitis, respectively, or by some combinations or equivalents of these terms. Granting that these designations correspond to clinical pictures which actually are in some degree different, the question is whether this or any other classification divides the family into groups

of cases which are clinically so distinct as to justify the presumption that the cases within each group are due to one common cause, which is different from the cause of each other group.

Townsend and Sydenstricker<sup>1</sup> have investigated this question by statistical analysis of the clinical records of all the cases of minor respiratory disorders reported during two years in a large group of families, the records being furnished by observers, most of whom were physicians. Assembling the reported cases into four main diagnostic groups, viz.: colds, bronchitis, sore throat, and influenza, they found that these groups differed from each other only in the relative frequency and prominence of symptoms which were more or less common to all, so that the groups overlapped. Moreover, they found that in reporting cases the observers frequently used combinations of the four principal diagnoses, so that altogether more than a dozen diagnostic classes were represented. Interposing the various combinations between the main groups the result is a graded series of variation in clinical types, so that no group differs from its nearest neighbor sufficiently to justify a strong presumption of specifically different causation.

In a smaller but somewhat more intensive study which is now in progress in Baltimore we have observed all the cases of minor respiratory disorders occurring in a group of families in the course of a year. Within the whole series the range of variation in symptoms noted is very wide, extending from acutely febrile cases, conforming to the classical descriptions of epidemic influenza, to simple coryza or tracheitis, with little or no constitutional disturbance. If these extreme types were taken by themselves, they would seem to differ widely enough to justify the inference that they were due to quite different causes; but when the whole series is classified we find, as did Townsend and Sydenstricker, that the extremes are connected by a gradation of intermediate types, so that one does not know where to draw lines of demarcation.

The conclusion drawn from these two studies, namely, that the different clinical types of minor respiratory disorders merge into each other by graded variations, is not at all inconsistent with the fact that separate types are generally recognized in medical literature, for careful reading of the type-descriptions as given by representative writers shows that where lines of differentiation are drawn they are either arbitrary or quite indefinite.

I think then, that if we take into account only *clinical* evidence, it is an open question whether the whole family of these minor respiratory diseases should be considered as varying manifestations of a

single specific cause or as including an indefinite number of separate etiological groups. It is not necessary here to present any argument on either side of the question, or to discuss the prospect that more definitive clinical evidence may be discovered. The point is simply that the clinical evidence now available, taken by itself, does not justify any strong presumption either that the whole family is, or that it is not, a single etiological unit.\*

Since neither clinical nor bacteriological observation has enabled us to mark off a definite group of cases which we may assume coincides with an etiological unit, we are in a dilemma with respect to epidemiological studies. If we begin by setting up a restricted clinical definition of the common cold, and confine epidemiological observations to cases coming within this definition, we may be making the same mistake that our forefathers made when they failed to identify membranous croup with other forms of diphtheria, and therefore run the risk of missing important epidemiological associations. On the other hand, if we include the whole family of minor respiratory diseases in one category, we may be obscuring, in the composite, distinctive epidemiological characteristics of its separate components, as would be the case if all the acute exanthemata were thrown into one undifferentiated group, so that facts concerning smallpox were confused with those pertaining to measles and scarlet fever.

The only way out of the difficulty seems to be to include the whole group of minor respiratory diseases in epidemiological studies, but with such detailed clinical and bacteriological records of individual cases as will permit any desired clinical groupings; then to ascertain whether any tentative groupings on a clinical or bacteriological basis correspond to significant epidemiological differences. This procedure has the merit that it involves no assumption as to the unity or diversity of causation for the group as a whole and that it affords the possibility of testing the significance of indistinct clinical differences by matching them against corresponding differences in epidemiological characteristics. However, the method is extremely laborious to carry out, even on a small scale, and obviously small scale studies do not suffice. Comparisons with respect to such features as rate and extent of geographic distribution require observations of the broadest scope.

The principle of seeking by epidemiological characteristics to supplement indistinct clinical differentiation of diseases is, of course, not new. It has been applied for many years in the study of epidemic

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\* It may be added that this is the usual view, for while many students of the subject, perhaps most of them, consider epidemic influenza a specific disease, distinct from endemic grippé and severe colds, they usually admit, more or less explicitly, that the differentiation is based partly upon epidemiological considerations. It may also be added that for the present bacteriological examination affords no significant basis for differentiation.

influenza, and less extensively in studies of the common cold. For instance, Townsend and Sydenstricker, in the study previously referred to, present statistical analyses of the seasonal and age distribution of cases classified clinically as colds, bronchitis, sore throat, and influenza, respectively, which show that as regards these epidemiological features the several groups differ from each other. To cite only one example, the age distribution of influenza differs from that of colds in their series; but granting that the differences are significant in a statistical sense, the question arises whether they are sufficient to indicate different specific causes.

A possible interpretation is that the age of the individual affected may be a factor in influencing the type of reaction to the same specific cause, as is true in diphtheria, where we find quite different age distributions for the laryngeal and pharyngeal forms of this disease. Likewise, such epidemiological differences as Jordan and others<sup>2</sup> have demonstrated between pandemic and inter-pandemic influenza present similar difficulties of interpretation; and it may be said generally of studies made upon this principle that the difficulties encountered in interpreting their data are even greater than those of collecting them.

#### CONCLUSION

In conclusion, it appears that the central problem involved in the epidemiology of the common cold is that of its relation to epidemic influenza and other members of the general family of minor respiratory diseases. Two of the approaches to this problem are at present being vigorously attacked by bacteriological and epidemiological studies, respectively; but the more direct approach, by way of clinical and pathological research, has received far less attention.

Considering that the problem is primarily one of identifying a pathological process, and that such identification appears to be fundamental to either bacteriological or epidemiological proof, the most urgent present need in the investigation of the common cold seems to be for more intensive clinical study of the whole group in which it falls.

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# Hospital Facilities for the Treatment of Cancer

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THE New York City Committee of the American Society for the Control of Cancer, with the approval and coöperation of the Commissioner of Health and the Commissioner of Hospitals, in 1929 made a preliminary survey of the field to ascertain what hospital facilities are available in the Metropolitan area for the treatment of cancer. The results were valuable chiefly because of the details obtained for the use of the Information Bureau of the committee. This bureau receives a large number of inquiries from persons who have cancer and are in need of hospital care, either free or paid, or who fear that they may have the disease and wish to be examined and if necessary properly treated. It is the custom of the bureau first to find out if the applicant has a physician to whom recourse should be had, and if not, to recommend one or two of the hospitals and clinics on its lists.

The need for hospital facilities for the treatment of cancer is shown by the following: The population of the City of New York during 1929 was estimated at 6,064,484. The total number of deaths in the city during the year was 77,482, of which 7,848, more than 10 per cent, were reported as due to cancer.

Totals by boroughs are given in Table I. These figures cover only the deaths certified as due to cancer. As cases of the disease are not reported to the Health Department, there are at present no means of estimating how many persons suffer from it, nor what ratio there is between the number of deaths and the total number of cases. It is, however, admitted that the average case of the disease runs a course of 3 years, which would mean that last year there were 23,544 persons in New York alone in need of treatment. But this again does not include those successfully treated by surgery or by radiation. Every physician knows that there are such patients, and that with better public understanding of the subject and of the good results obtained

TABLE I

## TOTALS BY BOROUGHES

	Estimated Population	Total Deaths	Deaths from Cancer
All boroughs	6,064,484	77,482	7,848
Manhattan	1,689,419	28,033	2,662
Bronx	977,819	10,952	1,254
Brooklyn	2,342,781	26,690	2,705
Queens	899,791	9,816	1,040
Richmond	154,674	1,991	187

by early treatment, the number is constantly increasing. Two things are essential: the providing of adequate facilities for the treatment of the disease; and bringing the sufferer to the hospital or clinic when the disease is still in an early stage and the chances for cure are more favorable. The latter is the particular function of the American Society for the Control of Cancer. The most skilful surgeon and the best equipped radiotherapist are alike helpless to control the disease unless patients reach them in an operable condition or at a stage when radiation is effective.

In order to secure the desired information, a questionnaire was prepared and sent to all hospitals in the area then under the jurisdiction of the committee, comprising the five boroughs and the counties of Nassau, Suffolk, and Westchester. One of the chief facts brought out by the questionnaire was the difficulty of obtaining accurate statistics on cancer treatment. In the majority of institutions cases of cancer are received in the general surgical wards, and no separate records of cases either in the hospital or after discharge are kept.

In a report issued recently by the Welfare Council, *A Health Survey of New York City*, the authors state:

The bed capacity specially assigned to cancer patients in New York City is approximately 838 beds, 460 in special cancer hospitals, 289 in homes for incurable cancer patients, and 89 estimated to be used for cancer cases in institutions for the chronic sick that receive cancer patients. Of these 838 cancer beds, 264 are in municipal and 574 in voluntary institutions. In addition many cancer patients occupy beds in general hospitals, but the number cannot be computed. In 1927, Mount Sinai Hospital with a total of 13,000 admissions had 675 cancer cases, that is, about 5 per cent of all admissions.

The number of cancer patients at one time in most of the institutions of New York City that receive cancer cases will be shown by the census of the chronic sick, which has been taken as part of the study of chronic illness now being made by the Research Bureau of the Welfare Council.

Memorial Hospital, in 1926, received 2,390 applications for admission, 542 of which were declined as unsuitable. The actual number of admissions was 2,032, of which 495 were free ward cases, 1,000 paid ward rates, and 537 private room cases.

Five cancer institutions—Memorial Hospital, the New York City Cancer Institute, Brooklyn Cancer Institute, House of Calvary, and St. Rose's Free Home—in 1927 received a total of 3,975 patients. The number of cancer cases among the 1,095 admissions of the Skin and Cancer Hospital is not known, nor the proportion of cancer cases among the patients of other institutions for chronic diseases.

Replies to the committee's questionnaire were returned by 93 hospitals which receive cancer patients. Of these, 4 received only patients in the late stages, when no cure is to be hoped for, and the need is for frequent surgical dressings and a comfortable place to die. These were St. Rose's Free Home (89 beds) and the House of Calvary (100 beds), in Manhattan and the Bronx; the Home for Dependents, a municipal institution, in Richmond; and Rosary Hill Home (100 beds) in Westchester.

St. Rose's Free Home and Rosary Hill Home are maintained by the Servants of Relief solely for the care of the poor and hopeless cancer patients. This care is entirely free. The House of Calvary is also maintained as a free home for incurable cases.

Of the 89 other hospitals, all received cancer patients in the early stages requiring operation; 73 received patients in the later stages for surgical treatment; 47 received patients for treatment by radiation with either X-ray or radium; and 6, in addition to those already listed, regularly cared for patients in the last stages. These last are the New York City Cancer Institute (Welfare Island) and Montefiore Hospital, in Manhattan and the Bronx; Cumberland and Kings County Hospitals, in Brooklyn; and Ossining and St. John's Riverside Hospitals in Westchester. The New York Skin and Cancer Hospital cared for any patients in late stages of the disease who had been formerly treated at the institution; and St. John's Hospital, Brooklyn, contemplated the establishment of a special department for inoperable cancer patients. In many of the general hospitals, patients in a hopeless state were received and cared for pending their removal, when possible, to one of the above institutions or to one of the homes receiving only the incurables; in some cases, when beds were available, such patients were held until death.

Thirteen received only those in the early stages for operation.

At all of these hospitals, cancer patients were admitted in the regular surgical services, and no special assignment of beds was made, so that the total number available is indeterminate. The majority of the hospitals reported that from 1 to 5 per cent of their bed capacity was occupied by cancer patients. The Jewish Memorial Hospital in the Bronx reported 10 per cent of cancer patients.



During 1929 there were in New York 6 hospitals devoted to or with special services for the treatment of cancer in any and all stages. See Table II.

Cancer patients applying at the general hospitals in any of the boroughs and found to be unsuitable for treatment were usually referred to one or the other of these institutions. In none of the other boroughs or counties of the district were any provisions made for the treatment of cancer patients in advanced stages.

TABLE II

## HOSPITALS DEVOTED TO OR WITH SPECIAL SERVICES FOR CANCER

Memorial	104 beds
Montefiore	40 "
New York City Cancer Institute	
(59th Street)	16 "
(Welfare Island)	192 "
New York Skin and Cancer	60 "
Cumberland *	Indefinite No.
Kings County	" "

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\* Since this information was gathered, the Cancer Division of Cumberland Hospital has been abandoned, and the patients removed temporarily to other hospitals, pending the erection of a modern building.

Thirty-eight of the hospitals were equipped to give treatment with X-ray; 45 reported that they were equipped to give radium treatment. In some of these the radium used was the property of the hospital, but in the majority of cases it was privately owned, usually by members of the attending staff. Some of the hospitals used only radium emanation which was purchased as needed.

The largest stock of radium was owned by the Memorial Hospital which had 4 gm. belonging to the hospital and 4 in the ownership of special trustees. One-half of this amount was kept in solution and only the emanation was used; the other half was used in element pack.

The New York City Cancer Institute had the use of 2 gm. of radium owned by the Department of Hospitals, and had an emanation plant on Welfare Island, with a yield of about 700 M.C. daily. This emanation was supplied in seeds and applicators to other city hospitals when needed. The element itself was not used in treatment.

Bellevue Hospital had the use of 1 gm., also owned by the Department of Hospitals. Here the element was used.

Beth Israel Hospital owned 236 mg. of radium, and expected to purchase an additional gram and install an emanation apparatus.

The Manhattan Eye, Ear, and Throat Hospital had the use of 206.128 mg., one-half of which was owned by the hospital, while the other half was private property. Other hospitals having radium are shown in Table III.

In many hospitals radium emanation was used in suitable cases, the chief sources of supply being the Memorial Hospital and the New York City Cancer Institute.

Thirty-one hospitals stated that radiation alone was sometimes used in operable cases, depending on the region involved and the type of growth, and occasionally also on the patient's own preference; 27 stated positively that no operable cases were treated by radiation only.

There appeared to be very little specialization among the surgeons treating cancer, except in the special hospitals, such as the Manhattan Eye, Ear, and Throat, the Memorial, the New York Skin and Cancer, and the Sloane Hospital for Women.

No special effort was made to secure autopsies on cancer patients in the general hospitals; they were performed when permission was obtained. But as a matter of fact, the cancer mortality in the general hospitals is small, as comparatively few patients are held until death. No definite figures were available.

Out-patient departments equipped to make diagnoses in cases of cancer were reported in 70 hospitals, the charge for the examinations being the usual clinic fee only, that is, ranging from nothing to \$5.00, with an average of \$.25 to \$.50.

Patients applying at the clinic and found to have cancer or suspected of having cancer were usually sent into the hospital for treatment or observation, though in some cases they were referred directly to the special cancer hospitals.

Laboratories properly equipped for the examination of tissues for diagnosis were maintained by 78 hospitals, and in every case but 2 were in charge of a physician. The exceptions were the Midtown Hospital and St. Mary's Free Hospital for Children. The latter has no adult patients; and on occasions when diagnosis was necessary material for examination was sent to the New York Hospital.

All but 7 of the hospitals with laboratories were equipped for the making of frozen sections for immediate diagnosis during an operation.

TABLE III

## MANHATTAN AND THE BRONX

Montefiore Hospital	mg. 500
Mount Sinai Hospital	260
New York Skin and Cancer Hospital	160
Presbyterian Hospital	200
Sloane Hospital for Women	200
Woman's Hospital	280

## BROOKLYN

Methodist Hospital	200
St. Mary's Hospital	100

Eight hospitals were without laboratory facilities; in one of these, however, a laboratory was under construction at the time the report was made. These hospitals send tissue for diagnosis either to the State Institute in Buffalo, to Bellevue Hospital, or to private laboratories in New York.

The system of following-up treated and untreated cases of cancer varied widely. In the general hospitals this usually was done as a part of the routine follow-up of all cases by the office, the out-patient department, or the social service workers.

The Presbyterian Hospital reported that it considered its follow-up clinic the best in the country, both treated and untreated patients being included. The cases were followed every 3 months, and the reports kept in a special section of the record room.

The Memorial Hospital reported that all cases were followed, the interval time being decided by the attending physician; in some cases patients were urged to report for examination as often as every 2 weeks.

Twenty-seven hospitals do not have a follow-up of either treated or untreated patients, though in almost all institutions the patient on discharge is urged to report for examination once a year, or oftener, to the hospital or to his own physician.

In some hospitals the follow-up was left entirely to the different services, each service being supposed to sustain its own.

In almost all cases where any regular follow-up was carried on by the hospital the returns were kept in the regular files, not as separate records.

Fifty-three hospitals reported that attempts were made to discover and treat precancerous symptoms—patients showing such lesions being kept under observation. Twenty-one hospitals reported definitely that no such attempts were made.

These figures indicate the inadequacy of provisions in the Metropolitan area for the hospitalization of patients suffering from malignant disease. Since then the City Department of Hospitals has begun the formulation of plans which will greatly increase the facilities and usefulness of its Division of Cancer.

The need for more adequate care for all other classes of cancer patients still exists, and calls for the development of special cancer hospitals, of cancer institutes connected with teaching institutions, and of special cancer services in general hospitals. With this increase in clinical facilities should go an increase in the facilities of the laboratory, as well as of the social service departments in charge of the follow-up work.

# Training and Personnel\*

THE following tables similar to those published in previous years present the data concerning students registered in schools of public health, and the public health degrees granted in the calendar year 1929.

TABLE I

NUMBER OF STUDENTS ENROLLED AND PUBLIC HEALTH DEGREES CONFERRED IN 1929 IN COURSES REQUIRING AT LEAST ONE YEAR OF RESIDENCE AND LEADING TO A PUBLIC HEALTH DEGREE

School	Degrees	No. Enrolled 1928-1929	No. of Degrees Granted 1929
1. University of California	B.A.	15	6
	M.A.	1	1
2. University of Chicago *			
3. Columbia University	M.S.	1	0
4. Detroit College Medicine and Surgery	Dr.P.H.	0	0
5. University of Georgia †			
6. Harvard School of Public Health	Dr.P.H.	2	2
	M.P.H. ‡	1	1
7. Johns Hopkins School of Hygiene	Dr.P.H.	7	7
	Sc.D.	41	7
	C.P.H.	24	20
8. Massachusetts Institute of Technology	S.B.	58	7
	C.P.H.	15	1
	Ph.D.	10	4
	Dr.P.H.	2	0
9. McGill University	D.P.H.	2	2
10. University of Michigan	M.S.		4
	Dr.P.H.	16	2
11. University of Minnesota	M.A.	1	0
12. University of Montreal	D.P.H.	0	0
13. Ohio State University	M.S.	5	2
14. University of Pennsylvania *	M.S.	12	5
	Ph.D.		2
15. Queen's University	0	0	0
16. University of Toronto	Ph.D.	3	1
	M.A.	2	1
	D.P.H.	11	9
17. University of Western Ontario	D.P.H.	0	0
18. Yale School Medicine	M.S.	8	2
	Ph.D.	10	4
	C.P.H.	7	2
	Dr.P.H.	1	1
Total		255	93

\* It is impossible to separate students taking degrees in public health from those taking biological courses.

† A course leading to a degree in public health is no longer offered.

‡ There were 7 other students doing full-time work but not candidates for any degree.

\*\* The School of Hygiene and Public Health has been discontinued. Provision is now made in the graduate school of medicine for the registration of students applying for this work.

TABLE II

NUMBER OF DEGREES IN PUBLIC HEALTH GRANTED IN UNITED STATES AND CANADA IN 1929

Degree	Degrees Granted	Number of Schools Offering the Degree
Certificate of Public Health	23	3
Doctor of Public Health	12	6
Doctor of Science in Hygiene	7	1
Doctor of Philosophy	11	4
Bachelor of Science	7	1
Bachelor of Arts	6	1
Master of Science	13	5
Master of Public Health	1	1
Diploma in Public Health	11	4
Master of Arts in Hygiene	2	3
	—	
	93	

The committee has collected certain data concerning positions for which various schools of public health were asked to recommend candidates. The information concerning the salary range of these positions was very incomplete. University of California, University of Chicago, Columbia University, Harvard University, University of Michigan, and Yale Medical School, supplied the data presented in the following table.

TABLE III

KINDS OF PEOPLE WANTED

	Number	Salary Range
Teaching Positions		\$2,300—\$5,000
Physiology	3	
Hygiene and Public Health	5	
Health Education (College)	2	
Health Education (Public Schools)	2	
Home Economics	1	
Bacteriology	2	
Nursing Education	10	
Health Officers, Commissioners or Administrators		\$3,500—\$6,000
County, City and State	20	
Executive of Community Council	1	
Obstetrician, Bureau of Infant-Maternal and Child Hygiene	1	
Physicians		
School and College	6	\$4,000—\$8,000
Industrial	3	\$19,000 (Only salary given)
Research	2	
Foundation	2	
Nurses		\$1,600—\$2,500
Supervising	1	
School	2	
Visiting	5	
Public Health	58	

TABLE III (cont.)

	Number	Salary Range
Laboratory Workers		\$1,500-\$2,500
Bacteriologist	2	
Laboratory Assistants	12	
Technician in Pathology and Histology	1	
Epidemiologists	4	
Statisticians	4	\$3,200-\$3,700
Miscellaneous		
Director Joint Employment Bureau	1	
Assistant Dairy Technologist	1	\$4,000
Editorial Assistant	1	
Asst. Industrial Health Service	1	½ time—\$50 to \$100 a week
Asst. Industrial Hygiene Bureau	1	\$3,000
Tuberculosis Field Worker	1	
Public Health Surveys	1	
Fellowships	2	

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## Amendment of Child Labor Legislation in Germany

THE temporary regulations governing the employment of young workers in Germany in glass works, in rolling mills, in iron works, and above ground in coal mines, have recently been amended to agree with the provisions included in the labor bill which is now pending in the Reichstag, but which will probably not be enacted for some time.

While previously a child could go to work in these industries at the age of 13 if he had completed the required school course, and in any case at the age of 14, the minimum age for employment in certain processes is now placed at 14, if the child has finished the prescribed school course; otherwise he must wait until he finishes the course. The minimum age for work in certain unhealthful processes is raised from 14 to 15 and in certain others from 16 to 18 years. Further limitations are placed on the number of exceptions to the prohibition of work at night of boys under 16, and provision is made for the gradual abolition of such night work. (The night work of women and girls was prohibited a number of years ago.)—*Reichsarbeitsblatt*, Berlin, No. 10, 1930.

## EDITORIAL SECTION

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## MENTAL HYGIENE

IN most of our commonwealths the administration of mental health measures has been conferred on state authorities rather than local. The state has maintained hospitals for the mentally ill, and schools for the defective, and has brought clinics to many communities. It has also assisted in removing the mentally sick from their homes or other places, when private institutions, the police, or the poor authorities have identified the patient and the court has authorized his detention. Only gradually has it been thought that these problems may be problems of public health.

Since most diseases involving the state of mind are not actively communicable, the health officer is not commonly charged with any duties concerning them. Nevertheless, such illnesses if not given prompt and appropriate treatment may be more dangerous to the individual than leprosy and more dangerous to the community than smallpox. Specifically, a man who is mentally sick may put a violent end to his life. This may terminate the usefulness of a person who has every expectation of recovery and restoration to usefulness. Furthermore, if the patient be excited rather than depressed or if he be the victim of mistaken ideas concerning the relation of people about him to his affairs, he may, by recklessness or aggression, cause the death of others, thus inflicting an injury more sudden than and as irreparable as if he communicated diphtheria or typhoid fever. Common illnesses that can cause the death of a sick person or of other

persons are concerns of public health officials and should be so recognized.

The apprehension and temporary care of the mentally ill, his danger and exploitation, his assignment and removal to proper hospitals are services necessary in every community. These services must be performed by public authorities, because the sick person may be at a distance from his home and his friends, or his friends may be inadequate to care for him. It has been customary to think of these problems as belonging to the police, but since we are no longer willing to think of the mentally sick person as a criminal, and since public care for all those who are mentally ill has assumed generous proportions in almost every state in the Union, we lack justification for continuing to turn these medical problems to departments of local government that are equipped to deal only with minor phases of the problem, instead of the heart and core of it.

It is now time to go to the root of the matter and declare that mental illness unless privately cared for should receive the oversight of medical authorities from the moment it comes to the attention of any public authorities. In the case of mental illness that requires any action on the part of community officials, the jurisdiction of the health officer should be invoked as promptly as for a case of smallpox. He is the official who should be responsible for diagnosis, temporary care and treatment, and all preliminaries to the admission of the patient to an appropriate hospital, including commitment if that be necessary.

It may be argued that the health officer is not an expert in mental diseases and might therefore be inadequate to deal with these problems. The reply is obvious: neither are other physicians in the community experts in mental diseases. The subject of mental illness is not so abstruse that it must always be placed in the hands of a specialist. The health officer has the machinery for investigation, and if in doubt about the diagnosis is in a much better position to obtain a consultation than is a police captain or the overseer of the poor. To him should be granted authority to make necessary expenditures for temporary care and transportation. He should also be given authority to commit on his own certificate to a mental hospital for a period of observation.

It may be added that this program, novel as it may appear to many communities, has already been in operation for 15 years in the State of New York. Its adoption has resulted in marked improvement in the care of mentally sick, pending their removal to state hospitals. The extension to the health officer has resulted in prompt action instead of the delay that brings no advantage to any interested



person, and merely satisfies some outworn conception of public caution and security. It puts power into the hands of the health officer, affords comfort and security to the community, and assures the patient that speedy relief which his condition demands.

## CANCER

THE increase in cancer is causing much concern in every part of the world. Health departments are being urged to take up the cancer problem as a public health matter, just as tuberculosis and other prevalent diseases have been and are now being handled. That much can be accomplished has been definitely proved in the case of tuberculosis as well as practically every other contagious disease. Cancer is not contagious, as far as we know, and this is probably one reason why health departments have been slow to take it up as a part of their regular functions.

Among the major causes of death, cancer now stands second, being exceeded only by heart disease. It is estimated that it causes at least 125,000 deaths yearly in this country, and the rate is steadily increasing. This increase has been the subject of much discussion, some holding that it is apparent, not real, due to better diagnosis. The weight of evidence, however, appears to be in favor of an actual increase.

The search for the cause of cancer is world-wide. Every so often a germ is discovered in cancerous tissues and held to be the causative organism, but no such finding has been able to withstand the tests of criticism. All remember the tremendous excitement over the alleged discovery of the germ by photography by two English observers a few years ago. Without passing an opinion on the matter, it can be definitely stated that this germ has not been cultivated, and that the researches which attracted so much attention have not advanced to a satisfactory stage, as far as the control of the disease goes, and the causative factor is still undiscovered.

It is known that certain industrial occupations in which tar and its derivatives are used involve a definite tendency to the production of cancer, and experimental work with these products has shown their cancerogenic properties.

The American Society for the Control of Cancer began its work in 1913, and has accomplished much in spreading information through the meetings held throughout the country during Cancer Week, as well as by publications. People now recognize that there is no disgrace in having cancer; that it is a disease to which all are liable, those

who escape being more fortunate than the sufferers. This is about all that can be said on this point at present, but it has had a decided influence in overcoming the tendency to concealment, especially as it is coupled with the assurance that cancers are local in the early stages, and many can be cured by competent physicians.

So far, only two state governments have definitely recognized their responsibility for the control of cancer—New York and Massachusetts. The former has recently made appropriations for the purchase of radium to be distributed among the hospitals of the state. The City of New York has led in municipal work since, in 1923, a City Cancer Institute was established, which secured the free services of excellent surgeons, and has provided two grams of radium, as well as other equipment. The city is now proposing to build a 400-bed hospital in connection with Bellevue, at a cost of  $4\frac{1}{2}$  million dollars. It is hoped that these examples will have their influence on other cities and states.

Our most earnest endeavors must be expended in educating the public, not only in the known facts concerning the disease, but in teaching them to avoid the "cancer specialists," ghouls who swarm every part of the country. There is no more repulsive business in the world than that conducted by these quacks, fattening, as they do, at the expense of human suffering and life. The public should also be taught the limitations of X-ray and radium treatment, and be warned that they are powerful agents, extremely dangerous in the hands of any but the best informed and experienced practitioners, and with limited powers, even in the best of hands.

## CONSTITUTION AND BY-LAWS, AND CONSTITUTION FOR SECTIONS, AMERICAN PUBLIC HEALTH ASSOCIATION

As Amended by the Governing Council at the Fifty-eighth Annual Meeting,  
Minneapolis, Minn., September 30-October 5, 1929

### CONSTITUTION

#### ARTICLE I NAME

The name of this Association, incorporated under the laws of Massachusetts, is the American Public Health Association.

#### ARTICLE II OBJECT

The object of this Association is to protect and promote public and personal health.

#### ARTICLE III GOVERNING COUNCIL

A. *Composition*: There shall be a Governing Council consisting of:

1. The officers of the Association.

2. Thirty members of the Council, to be elected by and from the Fellowship of the Association, for three-year terms, one-third retiring each year. These members of the Council shall be nominated and elected as provided for in the By-laws.

If one of these members is elected a Section Chairman, Vice-Chairman, or Secretary, or appointed the representative of an Affiliated Society, a new Councilor to fill such vacancy shall be elected by the Governing Council.

3. The Chairman, Vice-Chairman, and Secretary of each Section.

4. Representatives to be appointed by Affiliated Societies as provided for in the By-laws. Such representatives shall be Fellows of the American Public Health Association.

5. The elective members of the Council of the Health Officers Section.

B. *Terms*: Terms of Councilors shall begin at the end of the annual meeting when elected, and shall terminate at the end of the annual meeting at expiration of term; provided that Councilors shall have the right to attend meetings of the Council in an advisory capacity as soon as elected.

C. *Re-election*: After two consecutive terms, an elective Councilor shall be ineligible for re-election to the Council during one Association year.

D. *The Officers of the Association* shall be the officers of the Council.

E. *Functions*: The functions of the Council shall be:

1. To establish policies for the Association and for the guidance of the Executive Board and the officers.

2. To establish Sections of the Association; to combine or discontinue them when necessary; to maintain coördination among them; and to formulate general rules governing the policies of the Sections.

3. To submit to the vote of the Association all resolutions which have received the approval of the Governing Council.

4. To elect and establish qualifications for Affiliated Societies, Fellows, and Honorary Fellows as provided in the By-laws.

5. To elect the Executive Board and the officers of the Association.

6. To receive from the Executive Board at its first session, at the time and place of the annual meeting of the Association, a definitely formulated statement of a program of the major activities proposed for the ensuing year. To determine at the annual meeting of the Association in general outline the allocation of Association moneys in the budget for the ensuing year. To require a report from the Chairman of the Executive Board in which the work, the accomplishments and the financial status of the Association during the year preceding such annual meeting shall be reviewed.

7. To publish after each of its meetings an abstract of the minutes of such meetings.

F. A *Quorum* of the Council shall consist of ten Councilors.

G. *Meetings* of the Council shall be called by the Executive Secretary at the request of the President, or at the request in writing of any twelve Councilors. In the latter case, the call to meeting, issued at least twenty days in advance, shall state the purpose of the meeting.

#### ARTICLE IV OFFICERS

The officers of this Association shall be a President, a President-elect, three Vice-Presidents, an Executive Secretary, a Treasurer, and the Chairman of the Executive Board. The officers, with the exception of the Chairman of the Executive Board and the Executive Secretary, shall be elected by written ballot of the Governing Council as provided in this article and in the By-laws. The President-elect shall serve as such from the close of the annual meeting at which he was elected to the close of the next annual meeting, when he shall au-

tomatically become President. As President he shall serve to the close of the next succeeding annual meeting. Other officers shall serve from the close of the annual meeting when elected, until the close of the next annual meeting, and all officers shall serve in any case until their successors are elected and qualified. A majority vote of the Councilors voting shall be required to elect, and if no candidate receives a majority vote on the first ballot, the candidate receiving the smallest number of votes shall be dropped after each ballot in succession until a majority vote is obtained. The Chairman of the Executive Board and the Executive

Secretary shall be elected by the Executive Board, which Board shall define the duties and authority of these officers, respectively.

#### ARTICLE V AMENDMENTS

This Constitution may be amended by a two-thirds vote of the Fellows of the Association present and voting at an annual meeting, provided that the specific amendment to be acted upon is published in the official publication of the Association not less than thirty days prior to the meeting, and provided further that the amendment has received the approval of the Governing Council.

### BY-LAWS

#### ARTICLE I MEMBERSHIP AND DUES

A. There shall be eight classes of constituents who may be elected from the United States, Canada, Mexico, Cuba, and such other countries as may be admitted to representation in the Association. This provision shall not apply to Honorary Fellows or Associate Members. The respective appellations, qualifications for election, and dues shall be as follows:

1. *Fellows*: Only professional health workers, who have been Members of the Association for at least two years, and of established professional standing (whether employed by public or private agencies or in independent private practice), shall be eligible for election as Fellows, provided that a Member shall be not less than thirty years old at the time the application for Fellowship is made, and provided, further, that the following persons shall be considered to have an established standing in the profession of public health, namely:

a. A person who has attained the degree of Doctor of Public Health, Doctor of Science in Public Health, Doctor of Philosophy in Public Health, or other equivalent degree, according to standards approved by the Executive Board of the American Public Health Association.

b. A person who has attained an academic or professional degree involving training in public health, and who has been regularly engaged in public health work for four years, having rendered meritorious service in the public health profession, either as a health officer or in responsible charge of work in a state or municipal department of health or other official public health organization.

c. A person who has done notable original work in public health or preventive medicine of a character to give him a recognized standing equivalent to that required for Fellows under paragraphs "a" and "b."

d. A person regularly engaged in public

health work for at least five years, who has given evidence of special proficiency in the service of an official or unofficial public health organization, and who has attained a professional standing equivalent to that required for Fellows under paragraphs "a" and "b."

e. A teacher of public health or one of its constituent sciences. As such he shall have attained distinction as an expounder of the principles of public health or its constituent sciences and he shall have had at least five years' experience as a teacher of public health subjects. Any years of experience as defined in paragraphs "b" and "d" that the applicant may have had shall be considered the equivalent of the same number of years experience as a "teacher."

f. A person not covered by the above, who has made substantial contributions to public health work in his chosen branch of public health service, and who has attained a professional standing equivalent to that required for Fellows under paragraphs "a" and "b."

The application for Fellowship shall be made on an approved form and shall be sponsored by two Fellows of the Association who shall be Fellows of the Section with which affiliation is desired, provided, however, that when affiliation with a Section is not desired, the sponsors may be any two Fellows in good standing in the Association. Fellows without Section affiliation shall be known as unaffiliated Fellows.

When the application has been duly sponsored and otherwise completed, it shall be transmitted to the Administrative Office of the Association, which will make note thereon of such knowledge as it may have concerning the standing of the applicant in the Association. The application shall be forwarded by the Administrative Office to the Secretary of the Section in which affiliation is desired, for the

approval of the Section Council, and when acted upon by the Section Council, it shall be returned to the Administrative Office by the Secretary of the Section, after he has made endorsement on the application of the action of the Section Council. When the application is for unaffiliated Fellowship, the Executive Board of the Association shall act in place of the Section Council. When the application has been approved by a majority of the Section Council or the Executive Board, as above provided, it shall be voted upon by the Governing Council, provided the name of the applicant shall have been officially published at least fifteen days in advance, and provided further that the application shall have been approved by the Committee on Fellowship and Membership.

A Fellow may belong to and vote in only one Section, but such affiliation may be transferred to another Section if approved by vote of a majority of the Council of the latter Section. Unaffiliated Fellows may become affiliated with a Section if approved by vote of a majority of the Council of the Section with which affiliation is desired.

The right to hold office or to serve as chairman of a committee in the Association shall be limited to the Fellows of the Association, whether Section Fellows or unaffiliated Fellows. The right to hold office or to serve as chairman of a committee in a Section shall, however, be limited to the respective Fellows in such Section.

The dues of Fellows shall be \$10.00 per year.

2. *Honorary Fellows:* Honorary Fellows may be elected by the Governing Council for distinguished service in public health. Honorary Fellowship shall not include voting power or payment of dues.

3. *Members:* Persons professionally engaged in public health work shall be eligible for election as active Members when sponsored by two Fellows of the Association. They may serve on committees, except as chairmen. Dues \$5.00 per year. A Member may belong to only one Section, but such affiliation may be transferred to another Section if approved by vote of a majority of the Council of the latter Section. Unaffiliated Members may become affiliated with a Section if approved by vote of a majority of the Council of the Section with which affiliation is desired.

4. *Associate Members:* Persons interested in public health shall be eligible as Associate Members. They may serve on committees, except as Chairmen. Dues \$5.00 per year.

5. *Sustaining Members:* Individuals or corporations interested in public health may be elected to Sustaining Membership. Dues \$50.00 or more per year.

6. *Affiliated Societies:* A state or provincial public health association or similar regional society including more or less than a state, primarily composed of professional public health workers and organized for the same general objects as the American Public Health Association, may be elected as an Affiliated Society, provided that not less than twenty of its active members and at least one-half of its active members are Members or Fellows of the American Public Health Association. Not more than one such society shall be admitted from the same area.

A society applying for affiliation shall submit a copy of its constitution and by-laws, its last annual budget, a roster of its members and such other evidences of its qualifications as may be required. It shall submit annually and at other times such reports on its financial standing, membership and other matters as may be required by the Executive Board of the American Public Health Association.

The Committee on Fellowship and Membership shall consider all applications for affiliation and report its recommendations to the Governing Council.

The annual dues of Affiliated Societies shall be one per cent of their gross annual income, the minimum dues per society being \$10.00 per year.

Each Fellow, Member, Associate Member, and Affiliated Member of the American Public Health Association shall be a member of the Affiliated Society to which he is eligible and no person eligible for election to an Affiliated Society shall be admitted to Membership, Associate Membership or Affiliated Membership in the American Public Health Association unless such person has qualified or at the same time qualifies as a member of an Affiliated Society.

For every Fellow, Member, Associate Member or Affiliated Member paying annual dues to the American Public Health Association, the American Public Health Association shall remit to the Affiliated Society of which such person is a member the sum of \$1.00 per annum.

7. *Affiliated Members:* This class of membership shall include all active (namely professional) members of Affiliated Societies, and in areas where no Affiliated Societies exist such other professional sanitarians as may be elected to this grade. Dues \$1.00 per year.

8. *Life Members:* Upon the recommendation of the Committee on Fellowship and Membership any individual member of the Association may be elected a member for life. Election to this grade shall not affect the privileges held by such individual in his previous grade of membership. The dues for Life Mem-

bers shall be \$100.00, payable within one year after election, and this payment by such member shall exempt him from any further dues.

**B. Election:** The election of Fellows (see A1 above), Honorary Fellows, Life Members, and Affiliated Societies shall be by the Governing Council.

The election of Members, Associate Members, and Sustaining Members shall be by the Executive Board.

Three-fourths of the votes cast shall be requisite for election.

Upon the recommendation of the Committee on Fellowship and Membership the Governing Council may discontinue the Membership, Fellowship or affiliation of any constituent. Three-fourths of the votes cast shall be necessary for such action.

**C. Dues:** Dues are payable annually in advance. All constituents paying dues shall be entitled to receive the AMERICAN JOURNAL OF PUBLIC HEALTH and, or, such other publications as may be designated by the Executive Board, which shall determine the proportion of dues to be devoted to this purpose.

Constituents of any class whose dues are unpaid for six months or more shall be considered not in good standing. Constituents not in good standing shall not be entitled to vote, hold office or enjoy other privileges or powers of membership. Good standing may be resumed upon the payment of all arrears and dues in advance for one year, provided, however, the lapsed period is not greater than one year. The Administrative Office shall notify by registered mail all constituents who have been in arrears for a period of eleven months. The names of constituents in any class whose dues remain unpaid for one year or more shall be presented to the Executive Board which shall order the names of such constituents stricken from the Membership roll, provided, however, such constituents have been duly notified as hereinbefore provided in this paragraph. Constituents whose names have been stricken from the rolls in this manner may be again admitted in the manner provided for the election of new constituents in the class for which they make application, provided such person or organization complies with the eligibility requirements at the time the new application is made.

## ARTICLE II GOVERNING COUNCIL

The thirty members of the Governing Council designated in Article III, Section A, Paragraph 2 of the Constitution, shall be nominated and elected as follows: There shall be a Nominating Committee composed of one Fellow elected by each Section at the preceding annual meeting, and an additional Fel-

low designated by the Executive Board, the latter serving as Chairman. This committee shall present to the administrative office at least two months before the next annual meeting the names of at least twenty and not more than thirty Fellows of the Association selected with due regard to geographical and Membership considerations as nominees for the Governing Council. The administrative office shall publish this list to the Membership. Upon the petition of twenty-five Fellows the Nominating Committee shall add the name of any Fellow to this list provided such petition is received fifteen days before the annual meeting. The time for closing the polls shall be determined each year by the Executive Board. The Fellows receiving the highest number of votes on a written ballot cast by the Fellows present and voting at the annual meeting shall be declared elected to fill existing vacancies. Should two or more candidates receive the same number of votes the Executive Board shall, when necessary, determine by written ballot the order of precedence.

## ARTICLE III EXECUTIVE BOARD

**A. Composition:** There shall be an Executive Board of nine members elected by the Governing Council, six of whom shall be past or present members of the Governing Council, and three of whom shall be the President, the President-Elect, and the Treasurer.

**B. Terms:** The terms of the President, the President-Elect, and the Treasurer as Executive Board members shall be one year each. The terms of the other members shall be three years each, expiring in rotation, two each year. The members of the Executive Board whose terms have not expired shall at the time of the adoption of this amendment continue in office until the expiration of the term for which they have been elected. At the annual meeting at which this amendment is adopted one member shall be elected for a term of two years and two members for a term of three years. Should a vacancy occur the Governing Council shall elect a member to fill such vacancy for the unexpired term. The terms of the members of the Executive Board shall begin at the end of the annual meeting at which they have been elected, and shall continue until the end of the annual meeting at expiration of term, provided that newly elected members of the Board shall have the right to attend meetings as soon as elected, and shall have no vote until installed.

**C. Relection:** After two consecutive terms of three years a member of the Executive Board shall be ineligible for reelection during one Association year. This provision shall not apply to an officer of the Association.

**D. Officers:** The Executive Board shall elect from its own membership a Chairman who shall serve in that capacity for such term as the Executive Board shall determine. It shall also designate such other officers of the Board as it may require for the conduct of its business.

**E. Duties:**

1. To direct the administrative work of the Association.

2. To act as Trustee of the Association's properties.

3. To plan methods for the procurement of funds.

4. To recommend budgets for the Association's work.

5. To conform to the policies of the Governing Council in the conduct of its work.

6. To appoint the members of the four Standing Committees and to authorize and confirm the appointment of all other Association committees.

7. To transmit a report of its proceedings and transactions to the Governing Council at least thirty days before each annual meeting.

8. In general to carry out the policies of the Governing Council between meetings of the latter.

**F. A Quorum** of the Executive Board shall consist of four members.

#### ARTICLE IV OFFICERS

The officers elected by the Governing Council shall be nominated from the floor by that body.

#### ARTICLE V COMMITTEES

There shall be four standing committees of the Association as follows:

1. Committee on Fellowship and Membership.

2. Committee on Meetings and Publications.

3. Committee on Administrative Practice.

4. Committee on Research and Standards.

**Organization:** All of the Standing and Special Committees of the Association shall be authorized and appointed by the Executive Board unless otherwise provided for in these By-laws. Unless otherwise provided for all section committees shall be named by the respective sections, and the personnel of such committees shall be confirmed by the Executive Board. The appointments of all Association and Section committees unless otherwise provided for in these By-laws shall expire at the next annual meeting. The Chairmen of the Standing Committees shall be designated by the Executive Board. The Standing Committees shall designate from among their membership such other officers as they may require for the conduct of their business. Each com-

mittee shall control its finances and policies within limitations prescribed by the Governing Council and the Executive Board.

#### *Composition and Functions:*

1. The Committee on Fellowship and Membership shall consist of one Fellow to be elected by each Section and an additional Fellow elected by the Executive Board. At the time of the adoption of this amendment the Executive Board shall designate which five of the members of this committee shall serve for one year, the balance to serve for two years. Thereafter, those designated to fill vacancies shall serve for a term of two years.

This committee shall pass upon the eligibility of Fellows, Members and other constituents, in accordance with the provisions of the By-laws. It shall carry on membership promotion and shall discharge such other duties as are assigned to it by the Governing Council or by the Executive Board.

2. The Committee on Meetings and Publications shall consist of five Fellows. At the time of adoption of this amendment the Executive Board shall elect five Fellows to serve for one, two, three, four and five years respectively. Thereafter, members shall serve for a term of five years.

This committee shall prepare plans and a program for the conduct of annual and other meetings of the Association. All publications of the Association, its Sections and committees shall be issued under the direction of this committee, which shall also be responsible for the editorial and financial policies and management of all such publications.

3. The Committee on Administrative Practice shall consist of fifteen Fellows as follows: Twelve shall be designated by the Executive Board to serve for a term of four years, the terms of three members of this committee expiring each year. The remaining three members of this committee shall be the Chairman, the Vice-Chairman and the Secretary of the Health Officers Section.

This committee shall engage in the collection of information regarding current public health practices and analyze the material obtained to derive standards of organization and achievement. The findings and standards may be made available to public health workers through publications, information and field service under such conditions as the committee may establish. The committee shall also be able to contract in the name of the American Public Health Association with public and private health organizations to make health surveys and to render consultant service for pay. The committee will be responsible for the financial policies of its work and may employ

such personnel as is necessary to carry on its activities within its approved budget.

4. The Committee on Research and Standards shall consist of fifteen Fellows representative of the various Sections of the Association appointed by the Executive Board. In the beginning the Executive Board shall designate five who shall serve for a term of one year, five for two years, and five for three years. Thereafter members shall serve for a term of three years.

This committee shall be responsible for carrying out research and the development of standards in the technical branches of public health service and training, and coordinate such research and standardization. This committee shall also be charged with the duty of reviewing from time to time standards already established. No standards shall be promulgated as the official and authorized judgment of the Association except with the approval of the Governing Council.

#### ARTICLE VI MEETINGS OF THE ASSOCIATION

There shall be at least one annual meeting of the Association, held at a place to be selected by the Governing Council. All papers and reports presented at the annual meeting shall be the property of the Association for publication, unless this right is waived by the Committee on Meetings and Publications. Special meetings of the Association may be called by a majority vote of the Governing Council, the Executive Board, or the Association.

#### ARTICLE VII SECTIONS

The Executive Board shall approve rules and regulations relating to the government of the Sections, and to the appointment of administrative committees: Sections shall elect their own officers.

A. *Officers* of each Section shall be a Chairman, a Vice-Chairman, and a Secretary. The Chairman, Vice-Chairman, and Secretary shall be the representatives of the Section to the Governing Council of the Association.

B. *Terms*: New terms begin and old terms expire at the end of annual meetings. After five consecutive years in any elective Section office, except that of Secretary, a member shall be ineligible to reelection to that office during one Association year.

C. *The Chairman* shall preside at meetings of the Section.

D. *The Vice-Chairman* shall preside at meetings of the Section in the absence of the Chairman.

E. *The Secretary* of the Section shall prepare the scientific program of the Section for

the annual meeting, subject to the recommendations of the Section Council, and he shall submit same to the Committee on Meetings and Publications and shall keep the minutes, and other records of the Section, and shall transmit to the Secretary of the Association a copy of the minutes of both business and scientific sessions as soon as practicable thereafter. When unable to be present at meetings, he shall thoroughly instruct a substitute as far in advance of the meeting as possible.

F. *Section Council*: There shall be a Section Council composed of the three officers of the Section and five members, who shall be Fellows of the Section.

*Terms* of members of the Section Council shall be five years each. In the beginning one shall serve for one year, one for two, one for three, one for four, and one for five years.

*Duties* of the Section Council shall be:

1. To recommend papers, and to make general recommendations in relation to the annual meeting program.

2. To advise on Section membership.

3. To advise on Section policies.

4. To submit annually to the Governing Council through the Executive Board a report of the transactions of the Section.

5. To report annually to the Governing Council through the Executive Board on the plans, scope and policy of the Section during the succeeding year.

6. To formulate rules of procedure for the Section.

7. To approve and transmit to the Governing Council resolutions originating in the Section.

8. To advise on the publication of papers and reports presented at the Section meetings.

9. To advise with respect to the appointment of technical committees, sub-committees or Section representatives on committees of the Association.

#### ARTICLE VIII FINANCES

All remittances to the Association shall be deposited to the account of the Treasurer. The Treasurer shall be custodian of investments of the Association and shall disburse funds in accordance with duly authorized vouchers. With the approval of the Executive Board he may establish a drawing account for the Executive Secretary, who shall send to members of the Executive Board a financial summary of receipts and disbursements each month. Once each month, or oftener if called for, he shall also forward to the Treasurer and President an itemized statement of all expenditures. The Executive Secretary and the Treasurer shall be bonded at the expense of the Association in an amount to be determined



by the Executive Board. The books of the Association shall be audited annually by certified public accountants, to be appointed by the Executive Board.

#### ARTICLE IX AMENDMENTS

These By-laws may be amended by a two-thirds vote of those voting on the Governing

Council during the annual meeting, provided that twenty-four hours prior written notice thereof has been given. The By-laws may further be amended by a two-thirds vote of those voting at any meeting of the Governing Council called for the purpose, provided that notice thereof shall have been given at least fifteen days prior to such meeting.

*A complete list of Fellows and Members  
of the American Public Health Association  
is being prepared, and will be published  
at an early date.*

# ASSOCIATION NEWS

INSPECTION TRIPS, RODEO AND BARBECUE FOR A. P. H. A.  
CONVENTION, FORT WORTH, TEXAS—OCTOBER 27-30, 1930

A. H. FLICKWER, M. D.

*General Chairman, Local Committee*

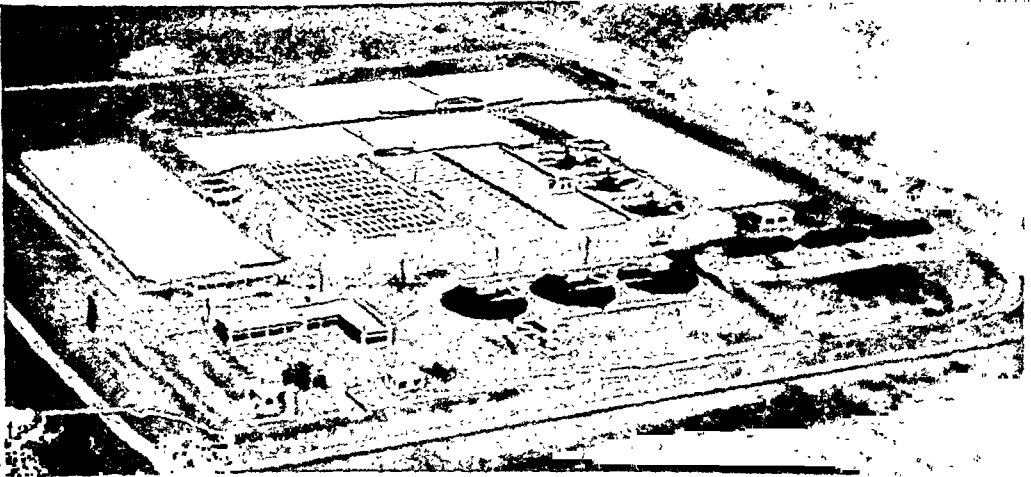
THE committee in charge of inspection trips has arranged a very interesting schedule. On Monday there will be a visit to the water filter plant which will be of interest to all sanitary engineers, chemists, and others who are interested in a modern water system. Fort Worth obtains its water supply from Lake Worth where it is brought from a conduit with a capacity of 50 million gallons per day to the filter plant.

This plant was completed in 1912 with a capacity of 5 million gallons per day, in 1917 it was increased to 10 million, and in 1923 to 20 million gallons per day. The city water works is an industry owned and operated by the City of Fort Worth, purifying, pumping, and delivering a commodity to its consumers the same as other public utilities.

The revenue from the sale of water is the only income. No part of the expense of this enterprise is borne by the taxpayers. The water works is required to be self-supporting, paying for all labor, materials, interest and maturities on outstanding obligations.

Another inspection trip on Monday will be to the Swift and Armour Packing Plants. This visit will require approximately 2½ hours, and the visitors will have an opportunity of seeing a modern packing plant in operation. The inspectors of the Bureau of Animal Industry will demonstrate the methods of meat inspection at this time.

On Tuesday there will be a trip to Terrell, Globe and Southwestern Laboratories. Terrell's laboratory will interest physicians and bacteriologists as

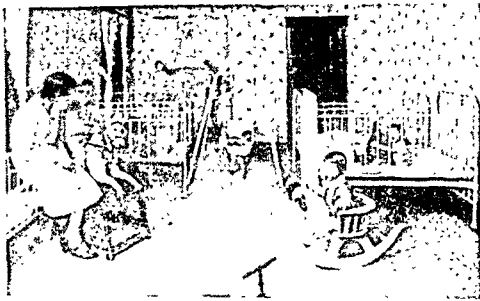


*Fort Worth Sewage Disposal Plant from the Air*

it is a very extensive laboratory with a large staff and does all of the laboratory work pertaining to public health, including bacteriology and chemistry. Globe Laboratory manufactures biologicals, and the Southwestern Laboratory does a great deal of commercial work.

On Tuesday there will also be a visit to Fort Worth's Municipal Airport. It is modern in every respect and one of the largest in the United States. It comprises 525 acres in all. There are 8 passenger air lines operating in and out of Fort Worth daily and 4 air mail lines. During the month of June alone, 3,524 passengers were carried in and out of Fort Worth by 845 ships. Fort Worth is the home port of some 150 airplanes, the majority of these being owned by citizens. During the convention, visitors may take airplane rides any time that they desire at the Municipal airport.

On Wednesday a special trip to the new sewage treatment plant has been arranged. The original plant, Imhoff



*Day Nursery Operated by the Department of Public Health and Welfare*

with sprinkling filters, with a capacity of 8 million gallons per day, was constructed in 1923-1924 at a cost of \$800,000.00. The plant was enlarged in 1929 to a capacity of 16 million gallons per day at an additional cost of \$780,000.00. The enlarged plant is one of the most complete units in the country, as it comprises a combination of the Imhoff sprinkling filter system with the activated sludge methods, having secondary settling tanks, clarifiers, and di-

gestion tanks. The digestion tanks are equipped with gas collectors. All gas is metered and record is made with the view of determining the possibility of using it for power to operate the plant. It is now being used for heating the



*Health Center Operated by Department of Public Health and Welfare*

buildings, digestion tanks and for fuel in the incinerator.

On Thursday there will be a trip to the various hospitals of the city including the new Methodist hospital, one of the largest in the south; Cook Memorial, one of the most beautiful; Children's hospital; Baptist; St. Joseph's; and others.

There will be several unscheduled trips to our various health centers, day nurseries, schools, etc. Fort Worth has 14 health centers, operated by the Department of Public Health and Welfare, which will be open to visitors, as it is the aim of the committee to have transportation ready at all times during the time that health centers, day nurseries, and schools are open to take small groups to visit them when they desire.

Another trip that will be made is to the Lancaster Yards of the Texas and Pacific Railroad which were recently completed at a cost of 5 million dollars. These railroad yards are modern in every respect, particular attention being given to sanitation and safety devices and should be of interest to civil, sanitary, and industrial engineers.

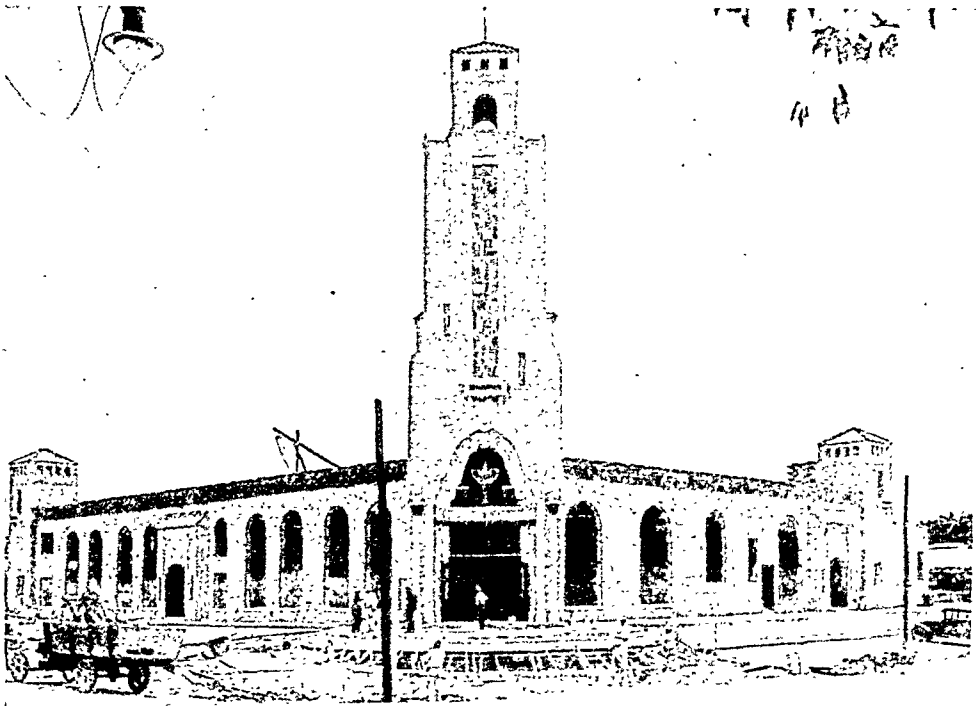
There will also be a trip around Lancaster, Fort Worth, which is the source of Fort

Worth's water supply. On this trip visitors will have an opportunity to see some of the Texas countryside in late October when it is, indeed, most beautiful. There will be a tour of the city, including a visit to the new farm market and other modern markets in the various parts of the city. Fort Worth is noted for its excellent markets and they are always of interest to the visitors from the north and east because they display all of the fresh fruits and vegetables produced in this vicinity.

It is the intention of the entertainment committee to stage a barbecue and

rodeo, probably on Wednesday afternoon and evening. The rodeo will consist of the usual features offered at real ranch roundups—riding of bucking broncos, bulldogging of steers, calf roping, trick riding, fancy roping, etc. Fort Worth is the home of many rodeo stars. Most of them will have returned from their summer engagements and should be available for our program.

A barbecue will be in the hands of experts who have for many years barbecued beef, mutton, and pork over the open fire and basted it with the famous Texas barbecue sauce.



*Fort Worth Public Market*

#### ANNUAL MEETING PROGRAM

**T**HE Preliminary Program of the scientific sessions will be published in the September issue of the JOURNAL.

During July a letter and descriptive folder were mailed to every Fellow and Member of the Association giving details of the post-convention trip of nine days to Mexico City.

Those attending the meetings are especially invited to stop over in San

Antonio, one of the most interesting cities in America. Letters of invitation have been received from several other nearby cities.

A letter giving full railroad information will be sent to the entire membership about September 10. The period of time over which reduced rates are available has been extended to take care of those going to Mexico City.

# PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

**Control of Scarlet Fever**—A questionnaire was recently directed to a number of city health officers inquiring concerning control measures now used for scarlet fever. The practice varies considerably in different cities and states. Twelve questions were asked and an answer given for each question describing the methods employed in the City of Detroit. The health officers to whom the questionnaire was directed have replied with the same general form of outline. With the purpose of giving this wider publicity and encouraging more discussion, this questionnaire is here printed in full.

## I

Q. What is your definition of *isolation* and *quarantine*?

A. We reserve the word "isolation" to indicate the restriction imposed upon the case affected with certain communicable diseases in such a place and under such conditions as will prevent the direct or indirect conveyance of the infectious agent to the public.

The word "quarantine" is reserved for the restriction placed upon contacts with cases of certain communicable diseases. These restrictions vary with the disease under consideration, and also with the circumstances under which the patient is isolated.

## II

Q. Do you date isolation of case from date of onset of disease, date of rash, or date of isolation?

A. It is our practice to date isolation from the day on which the patient was isolated, as is required by the regulations of the State Department of Health.

## III

Q. What is the duration of isolation of simple uncomplicated cases of scarlet fever, and also of complicated cases of scarlet fever?

A. Simple uncomplicated cases of scarlet fever are isolated for a minimum period of 28 days.

Cases complicated with otitis media, if the same has developed during the course of scarlet fever, will be isolated for a minimum period of 28 days, or a maximum period of 56 days if the patient is isolated at home. The isolation will continue for 1 week unless the symptoms of otitis media subside in the meantime. If, at the end of 35 days, there is a discharge from the ear, the isolation period is terminated, but a warning sign is posted until the discharge ceases, unless a period of 56 days is exceeded, in which instance the case is released completely.

If the patient has been cared for in the hospital, cultures for hemolytic streptococci are taken from all abnormal discharges at the beginning of the 25th day. The patient is detained at the hospital until either the discharge has ceased or cultures from same are found to be negative for hemolytic streptococci on two occasions at least 24 hours apart, at which time the patient will be released.

Cases of scarlet fever complicated with rhinitis and sinusitis, or with pharyngitis and cervical adenitis, or skin lesions, empyema, etc., are isolated for the same periods as indicated above.

## IV

Q. Is the period of isolation of cases determined by (a) clinical conditions alone; (b) bacteriological findings; (c) legal requirements; (d) all three conditions?

A. All uncomplicated cases of scarlet fever are released at the end of 28 days on clinical conditions alone. If the patient is isolated at home, the period of isolation is terminated on cessation of clinical conditions, but he is not held longer than 56 days. If the case is cared for in the hospital, simple cases are released at the end of 28 days on clinical findings alone. If, however, complications have arisen, bacteriological examinations are made of abnormal discharges, and the patient is released upon two negative examinations for hemolytic streptococci, provided the clinical conditions are otherwise satisfactory.

## V

Q. Do you limit activities of patients after release?

A. School children who have had scarlet

fever are not admitted to school until 7 days subsequent to their release from isolation.

## VI

Q. What is the duration of quarantine of immediate and susceptible contacts: (a) when the patient is isolated at home with the contacts; (b) when the patient is removed to the hospital or other place; (c) when contacts are removed to the home of adult friends?

A. It is our practice to quarantine susceptible contacts (under 16 years of age who have not had scarlet fever) who are in the same home with a case of scarlet fever as long as the isolation is maintained for the case. If, however, the patient is moved to the hospital, the susceptible contacts are detained at home by a warning sign until 7 days after last exposure. Foodhandlers and teachers, unless they have had scarlet fever, may not resume their usual occupation until 7 days have elapsed, but they may do other work. If within the 7-day period they develop a sore throat and fever, they must immediately stop such work and place themselves under the care of their private physician. When contacts are moved to the home of adult friends, they will be restricted to the premises by a warning card for a period of 7 days, after which, if no symptoms of scarlet fever have appeared, they may return to school or their usual work. By the use of these two methods it is our experience that the incidence of secondary cases among contacts is reduced about 60 per cent.

## VII

Q. Do you recommend any prophylactic treatment or provision for contacts?

A. 1. We recommend the removal to the home of adult friends of all young immediate susceptible contacts.

2. If this cannot be done, the removal of the patient to the hospital is a helpful method.

3. The intra-muscular injection of young contacts with 7.5 c.c. of convalescent scarlet fever serum has been found to prevent the development of secondary cases in about 85 per cent, as compared with the incidence where serum was not used.

## VIII

Q. Do you recognize scarlet fever carriers? If so, what do you do with them?

A. We recognize scarlet fever carriers only by the appearance of secondary cases. The carrier state usually ceases within a couple of weeks from the release from isolation. Occasionally, several secondary cases are observed occurring at more or less frequent intervals over a period of some months subsequent to release from isolation. Carriers of this kind are hospitalized and their throats treated until negative hemolytic streptococcus cultures

are obtained. Occasionally, the tonsils are removed and the carrier state ceases at once.

## IX

Q. What type of restriction is required at the home for isolation or quarantine?

A. If the house is small, the whole house with certain contacts is placarded and thus placed within the isolation area. It frequently happens that the wage earner desires to reside at home. It is usually possible to seal off one room at the house so that he can have access to this room through the window. Several adults can make use of a room of this kind at such a home. In larger homes where there is more than one bathroom with toilet facilities, it may be possible to seal off a portion of it so that in the isolation area will be a bathroom, a sleeping room, provision for cooking and laundry work. Also, it may be desirable to have the food prepared in the kitchen of the home and brought to the entrance of the isolation area. This arrangement is allowed when a registered trained nurse is in charge of the case.\*

The remainder of the house is called the Quarantine Area if occupied by other members of the family, of whom only the wage earners may go out and reënter as necessary. Some other homes are large enough so that a part may be sealed off completely from the rest of the home. This provision is allowed whenever possible.

## X

Q. What kinds of placards do you use in the control of scarlet fever cases?

A. For the absolute restriction of a case and contacts to a limited area, a red colored placard 6" x 9" is employed which reads as follows:

### SCARLET FEVER

*No Person Shall Enter or Leave This House Until This Card is Officially Removed.*

*\$500 Fine for removing or defacing this Notice without Written Authority from the Department of Health.*

*If removed or defaced without authority,*

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\* In order to secure a supply of qualified private duty nurses who have had special training in the care of communicable diseases, we have recently arranged with the local bureau of nursing to give a special permit card which allows the possessor the privilege of leaving the quarantine area at night and residing elsewhere if she so desires. The qualifications for securing this permit are that she have at least 3 months' training in the care of communicable diseases at our communicable disease hospital or its equivalent, and 3 days' training in field work with the communicable disease nurses of this department. She must be a registered nurse, and must provide suitable testimonials from 2 physicians.

## AMERICAN JOURNAL OF PUBLIC HEALTH

occupant of the house must report to the Department of Health, 1300 Beaubien Street, 7th Floor, Telephone Cadillac 2810, otherwise receive the same penalty.

DETROIT DEPARTMENT OF HEALTH

Sometimes a person will be reported who has symptoms suggestive of a case of scarlet fever. There are several diseases for which a similar card can be used. Hence, a warning card has been prepared which has the same size, and a space is left vacant into which the nurse can place a sticker bearing the name of the disease. This warning card reads as follows:

## WARNING

*A person who has symptoms suggestive of a case of scarlet fever lives here. The danger of catching this disease is not as great as it would be if the person were sick of the disease. However, the movement of this person is restricted to the premises until a definite diagnosis can be made and this card has been removed.*

*This is for the benefit of the general public. The removal or defacing of this notice is punishable by fine or imprisonment.*

DETROIT DEPARTMENT OF HEALTH

Where a portion of a house is occupied by the patient and caretaker, the entrances to the remainder of the house are placarded by a warning sign of the same size which reads as follows:

## WARNING

*A case of scarlet fever is isolated in a portion of this home. The remainder of the house is a quarantine area which is occupied by other members of the family. Only the immediate members of the household are allowed within this area. Such occupants are prohibited from entering places of public assembly and public conveyances. Children in this area are prohibited from association with any other persons during the period of this quarantine.*

*Any information regarding infringement of these restrictions will be appreciated by the Department of Health.*

DETROIT DEPARTMENT OF HEALTH

Children who are contacts with a case of scarlet fever are frequently transferred to the home of adult friends. The following warning card is posted for a period of 7 days:

## WARNING

*A person who has been exposed to scarlet fever lives here. The danger of catching this disease is not as great as it would be if the person were sick of the disease. However, the movement of this person is restricted to the premises until this card has been removed.*

*This is for the benefit of the general public. The removal or defacing of this notice is punishable by a fine or imprisonment.*

DETROIT DEPARTMENT OF HEALTH

## XI

Q. Do your regular investigation report blanks indicate name of contacts, possible source of infection, milk supply?

A. Our regular investigation report blanks require all of the above mentioned information.

## XII

Q. Have you any special remarks to make regarding the control of scarlet fever?

A. We have not had an outbreak of scarlet fever due to infected milk for the past 15 years, since our milk supply has been pasteurized. About 40 per cent of our cases of scarlet fever are cared for at our community hospital. This provision is especially valuable for the care of cases where (a) it is difficult to maintain an isolation; (b) where it will be a financial hardship to the family to have their home in quarantine; and (c) where the serious illness of the patient makes it impracticable to have adequate nursing care at the home.

Occasionally, physicians desiring better medical facilities arrange with the hospital to care for their case in a private room. About 5 per cent of the hospital beds are used in this manner.

It has been known for a long time that the blood serum from persons who have recovered from scarlet fever was a good prophylactic to give young contacts. It has not been possible to arrange for the use of this serum on a wholesale basis. During the last 2 years the department has provided a Serum Clinic which has required the full time of a nurse to secure donors to fill a clinic twice weekly at the rate of \$10 per sample of blood taken. There are 6 to 8 donors present at each clinic. A section of the laboratory has been set aside for the care of the blood received at this clinic. A Kahn test is made of each sample. The blood serum is collected, several samples are pooled, carbolic acid to the extent of 0.4 per cent is added, the serum is put up in bottles of 7.5 c.c. each and also 30 c.c. each, incubated for 1 week and prepared for distribution to physicians.

Outbreaks in institutions or hospitals are cared for in the following manner: Susceptible contacts on the wards and hospital personnel are Dick tested. Those found to be Dick positive are given 7.5 c.c. of convalescent scarlet fever serum. This has been observed to be a very satisfactory method of handling institution outbreaks.

Outbreaks in public schools have been a source of considerable effort. When 2 cases of scarlet fever occur in a school room, all children are inspected by the school nurse, and often by a physician for evidence of sore throat, fever and desquamation. Such cases are excluded at once, and referred to a diagnostician to determine whether or not the patient has scarlet fever. Such children are not allowed to return until given a permit card by this department. During the past 2 years the experiment has been made in 3 schools. When the number of cases at the school was excessive, a request slip was sent home to the parents seeking the privilege of doing a Dick test on their child, and stating that if the case was Dick positive the Department would appreciate an opportunity to give the child convalescent scarlet fever serum. The parents, however, were given the opportunity to have the Dick test made and the serum given by their own family physician if he so advised. Not all parents granted this privilege. These children were used as controls. The experience of these 2 years warrants a continuation of this method on a larger scale.

Experimental work is in progress which was suggested by the work of Loewenstein that toxoid could be absorbed by lanolin, and when rubbed into the skin would stimulate the production of antibodies so that the children would become Schick negative. This principle was applied to scarlet fever. Strong scarlet fever toxin was rubbed up in lanolin in proportions that 1 gm. would contain 10,000 skin test doses. Repeated applications of this inunction to Dick positive children has led to their reactions becoming Dick negative. Work along this line is being actively pursued.

NOTE: All answers refer to practice by the Detroit Department of Health.

**The Tragedy with BCG Vaccine at Lübeck**—A serious accident involving the use of BCG Vaccine has been reported by the Berlin correspondent of the London *Lancet*. At Lübeck, 246 infants were treated according to the method recommended by Calmette. Of these, 50 became ill with swelling of the inguinal and abdominal glands and other symptoms of tuberculosis. Four-

teen deaths have already occurred. It appears that the original culture was purchased in Paris and that sub-cultures were made in Lübeck. It is declared that the vaccine, as sent from Paris, was in good condition and that some mistake must have been committed in its application. Criticism has been made of the fact that the work was done outside of hospitals and that midwives were instructed to give the vaccine, provided the parents consented. The situation is being thoroughly investigated by the German Health Office.—*Lancet*, 218: 1137 (May 24), 1930.

**Public Health Administration**—The part that the organized medical profession should play in public health is scarcely second to that of health departments themselves. Local health societies should have public health committees who actively coöperate with and supplement the work of the health officer. Unofficial health agencies must also pattern their activities so as to fit into the official health program. Their work must augment that of the health department without duplication of effort. Medical colleges, state teachers' colleges and the public schools must play an ever increasing rôle in the promotion of health education. The development of facilities for early diagnosis and early treatment by the organized medical profession at a known cost is frankly socialization of the practice of medicine. Such socialization is inevitable. It rests with the profession whether it should seize the initiative and satisfy this demand or stand passively by and be compelled to submit to the process while it is carried out by outsiders.—Allan J. McLaughlin, *Pub. Health Rep.*, 45: 1191 (May 23), 1930.



# LABORATORY

C. C. YOUNG, D. P. H.

## A RAPID METHOD OF USING THE SABIN SLIDE MICROSCOPIC TEST FOR DETERMINING THE TYPES OF PNEUMOCOCCI \*

JESSE G. M. BULLOWA, M. D., AND AUDREY H. SCHUMAN

*Department of Health, New York, N. Y.*

WITH the separation of additional types of pneumococci by Cooper and her coworkers, which now number 23, and the production of their specific antisera, rapid typing such as can be done with the Sabin method with small amounts of material recovered after injecting a single mouse is of great value to specific therapy.

With the ordinary macroscopic precipitation and agglutination tests at least 0.2 c.c. are necessary for each test. If each of the new types were tested individually, this might require the injection of several mice for each patient, even if sputum were available for the purpose.

With the microscopic slide agglutination test developed by Sabin† in our laboratory, it is now possible to use small amounts of peritoneal exudate such as may be recovered at the end of 3 to 4 hours after the injection of sputum, using the method of Avery and his coworkers. As the best therapy depends upon prompt administration of specific serum, any procedure which limits the amount of material necessary and the number of manipulations prior

to the determination of type is important.

The testing for the presence of a single specific agglutinin in a mixture of several agglutinins is a well known immunological procedure. It is necessary, however, to determine by trial whether the mixing of several agglutinating antisera is an advantageous procedure in view of the possibility that group reactions in the typing sera might reduce the specificity of the reactions for the individual types. For this purpose we divided our 23 types into the following five groups: (A) composed of types 1 through 5; (B) 6 through 10; (C) 11 through 15; (D) 16 through 20; and (E) 21 through 23.

After determining which mixture of antisera agglutinated the peritoneal exudate from the mouse, the specific type was then determined by testing the exudate against the individual type antisera included in the mixture. However, since the types are not distributed evenly in this community, we have thought it an advantage to group them in the following way: Antisera for Types 1, 2 and 3‡ were not pooled so they could be tested individually, but

\* From the Littauer Pneumonia Research Fund, New York University, and the Medical Service, Harlem Hospital.

† The "Stained Slide" Microscopic Agglutination Test. Application to: 1. Rapid Typing of Pneumococci—Albert B. Sabin. *Proc. Soc. Exper. Biol. & Med.*, XXVI: 492-494, 1929.

‡ Type 3 was tested individually because of its atypical morphology and agglutination rather than because it occurred frequently. Type 3 organisms have a very large mucoid capsule and accordingly agglutinate very loosely.

the antisera 4 through 8 were mixed, and the mixture was termed group A. Drops of diluted 1, 2, 3, and A were placed separately on one slide. If the pneumococcus being tested did not belong to one of these types, it was tested in the remaining type antisera, arranged in groups B, C, D, and E. Thus a large proportion of our cases, due to the frequency in this community of types 1 through 8, will be diagnosed on the first slide.

According to the strength in agglutinin we have used one of three different dilutions of serum in saline in these tests: (1) 1:25, (2) 1:15 and (3) 1:10.

With the antisera available for these tests all of these three dilutions have been usable but the 1:10 dilution was most satisfactory. This method has been used thirty times and controlled by testing separately for each type. In no case have we failed to determine the type correctly by this short cut method. In addition to the saving of labor and material the early administration of specific therapy is of great advantage. The mixtures given are arbitrary; the groups may be rearranged

to fit the prevalence of the various types in different age groups or in different communities.

(1) *1:25 Serum Dilutions*  
*Group A*

0.1 c.c. of type 4  
0.1 c.c. of type 5  
0.1 c.c. of type 6  
0.1 c.c. of type 7  
0.1 c.c. of type 8

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0.5 c.c. combined sera plus 2 c.c. saline

(2) *1:15 Serum Dilutions*  
*Group A*

0.1 c.c. of type 4  
0.1 c.c. of type 5  
0.1 c.c. of type 6  
0.1 c.c. of type 7  
0.1 c.c. of type 8

---

0.5 c.c. combined sera plus 1 c.c. saline

(3) *1:10 Serum Dilutions*  
*Group A*

0.2 c.c. of type 4  
0.2 c.c. of type 5  
0.2 c.c. of type 6  
0.2 c.c. of type 7  
0.2 c.c. of type 8

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1.0 c.c. combined sera plus 1 c.c. saline =  
2 c.c. total volume of solution A

## A CONVENIENT MIXING CAN FOR USE IN PREPARING DIPHTHERIA TOXIN-ANTITOXIN MIXTURE

GEORGE F. LEONARD, M. D.

*New Brunswick, N. J.*

THE increasing demand for large quantities of diphtheria toxin-antitoxin mixture made it desirable to prepare large lots in a single mixture. Although the toxin-antitoxin is put through a Berkefeld filter after the mixing, we have always endeavored to keep the material as free from bacteria as possible by using only sterile ingredients and making the mixture in a closed sterile container. Since we were unable to find a suitable mixing can in any of the catalogues from supply houses, we devised

a simple container, which we have found very convenient and durable, for use in preparing toxin-antitoxin mixtures. This container may be used in mixing any sterile preparation.

### DESCRIPTION OF CAN

The capacity of the can is 120 liters. This allows ample air space for mixing 100 liters at one time. It is made of copper, lined with tin. It is the shape of an elongated cylinder slightly rounded at each end. The ends are sufficiently

rounded to contain no corners or grooves, which aids in its cleaning; but the bottom is flattened so that it will stand on the floor or a table unaided.

The dimensions of the can, outside measurements, are:

Height, 36".

Width, 19".

Height (straight side), 24".

Manhole (in top for cleaning), 6" diameter.

The weight of the can complete is 35.5 kg.

The can has a heavy iron band around the center on the outside, 2" in width and  $\frac{5}{8}$ " in thickness. From this band a short shaft extends on either side of the can. Each of these is 3" long by  $1\frac{1}{8}$ " in diameter. The shafts are used in rotating the can in mixing. Just above the iron band, and half-way between the two shafts on either side, is a large handle for lifting.

The manhole cover is threaded into the top of the can and has an asbestos or rubber gasket to prevent leakage. The former is more serviceable, as it is not easily affected by sterilization. This cover contains a flange  $1\frac{1}{2}$ " high on top to aid in tightening the lid. In the center of the cover there is a 1" brass stop-cock for the introduction of all materials for mixture. To one side of this stop-cock in the cover is a small stop-cock which is used for an air vent to prevent the liquids from bubbling when being introduced through the larger opening. This small air vent stop-cock is the same as is used to drain automobile gas tanks. At the bottom of the

tank is a  $\frac{1}{2}$ " brass stop-cock with the end small enough to go into the mouth of the bottles used in collecting the material.

The can is supported by two wooden horses with a bearing on each to support the shafts on the can. The bearings are made from a piece of iron bar  $1\frac{1}{4}$ ", bent to hold the shaft, and bolted to the wooden supports. These bearings could be placed on top of tables, or on brackets supported from a wall. The bearings should be about 34" from the floor to allow free rotation of the can in mixing, and also to allow space for the bottles in emptying the can.

The can is sterilized in the autoclave before use.

#### MIXING

When all materials have been placed in the can, the manhole cover is made thoroughly tight by means of some wooden object such as a hammer handle or heavy stick, and the stop-cock and air vent are closed. Mixture is made by completely rotating the can on the shafts by means of the handles on the can. It is so well balanced that this is easily done even by one hand.

When mixing is complete the air vent in cover is opened and the material withdrawn from the lower stop-cock directly into sterile bottles. By slightly rotating the can near the end almost the last drop may be removed from the can into the bottles.

The cans were made by George Keller, Copper Works, Brooklyn, N. Y.

# VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

**Smallpox in the United States and Canada, 1929**—Reports from 44 states, the District of Columbia and 8 Canadian provinces show that more cases of smallpox were registered in 1929 than in 1928 or 1927. For both countries combined, there were fewer deaths, and, therefore, a lower case-fatality rate. In Canada, there was much less smallpox than in 1928 or 1927, and the case-fatality rate was low.

In the United States, Illinois reported more cases than any other state, but Louisiana, Maine, Georgia and Texas had notably high case-fatality rates. The country experienced its highest case-fatality rates in areas where there were relatively few cases of smallpox. The only exception to this among the states in 1929 was Texas.

Seldom does a year elapse without affording one or more examples of what happens when smallpox of the more malignant type attacks a community. In outbreaks in Washington, D. C., and Camden, N. J., in 1925, the case-fatality rates were 33.9 per cent and 39.8 per cent, respectively; in 1926 there were 232 deaths in California out of 2,794 cases; and in Arizona there were 6 deaths among 18 persons attacked.

In 1927, a number of cities recorded high case-fatality rates, although, fortunately, the cases themselves were small in number. In Wyandotte, Mich., for example, only 3 smallpox cases were reported in 1927; but all died. In 1929, El Paso, Tex., was the most outstanding example of what happens when virulent smallpox attacks a community. Here there were 11 deaths among 59 cases, corresponding to a case-fatality rate of 18.64 per cent. If this

ratio of deaths to cases had prevailed among the 38,062 persons who had smallpox in 45 American states last year, about 7,100 deaths would have resulted. The same case-fatality rate among 4,251 cases in Illinois would have caused the deaths of nearly 800 persons instead of the 17 which were actually charged to this loathsome disease in that state. In 1922, the case-fatality rate in 43 American states was 2.8 per cent. Had that rate prevailed in 1929, there would have occurred 1,066 deaths in 44 states and the District of Columbia, instead of the 132 that were actually recorded.—*Stat. Bull.*, Met. Life Ins. Co., 11: 6-7 (May), 1930.

**Rheumatic Fever in Children**—A survey in Rochester, N. Y., showed that the incidence of acute rheumatic infection was from 8 to 10 per cent; acute rheumatic fever involved 2.5 per cent; growing or joint pains were reported in 7.0 per cent; chorea in 0.5 per cent, and heart disease in 2.6 per cent. In this survey it was found that in a group of 20,000 tonsillectomized children between the ages of 5 and 15 years, 399 developed acute rheumatic fever. These children had been tonsillectomized for an average period of 5 years. In a like group of 20,000 untonsillectomized children for the same period, 630 developed acute rheumatic fever. From the same groups it was learned that 1,267 children of the operated group had growing pains, while in the control group 1,530 had the same complaint.

Chorea occurred in 85 children among the operated group and in 75 children not treated. Carditis was found in 450 of tonsillectomized children and in 595

of untreated children. These statistics seem to show that there is a definite lessened incidence of rheumatic infection except chorea in like age groups where tonsils have been removed.

The influence of tonsillectomy in chorea was studied. The incidence among 20,000 tonsillectomized children was 0.4 per cent while among as many untreated children 0.5 per cent. It is interesting to note that the incidence of carditis was 62 per cent among children who developed chorea while the tonsils were in, and 47 per cent among those who developed chorea after tonsillectomy. Removal of tonsils offers very little in the control or prevention of chorea, according to these data.

Among the total 40,000 school children, it was found that 450 whose tonsils had been removed showed evidence of rheumatic heart disease. This represented 2.2 per cent of the entire operated group. Among the 20,000 untensillectomized children, the incidence of cardiac disease was 2.9 per cent. The lessened incidence of carditis in children whose tonsils had been removed was probably due to lessened incidence of rheumatic infection in general in those children.—A. D. Kaiser, *New York State J. Med.*, 30: 325-330 (Mar. 15), 1930.

**Obstetric Costs**—An investigation was undertaken in Berkeley, Calif., regarding the physical conditions surrounding maternity and infancy. The sample used was based on the selection of every third birth registered in the city during 1928. A total of 390 obstetric cases was the basis for the investigation and data on cost of obstetric service were obtained for 376 of these cases.

In the series of 390 cases, 144 individual physicians were in attendance, giving an average number of 2.7 confinements per physician. One of the outstanding facts of this study was the

large number of Berkeley mothers confined in hospitals. Of the 390 deliveries, 85.6 per cent occurred in hospitals. During 1928, 83.51 per cent of the total live births occurred in hospitals and 28.9 per cent of these in one hospital. The average number of days spent during confinement in hospitals was 10.

In taking physicians' charges, the amount billed to the patient was used. The average cost per obstetric case was \$92.12, with a median of \$73.87. The modal or most frequent charge was \$50. There was no charge by the physician to 6 patients; the other expenses in these cases totaled \$760.75 or \$126.79 per case. Thirty-one deliveries took place in the county hospital; 17 of the 31 patients paid \$249.80, averaging \$14.69 per case; the other 14 paid nothing for their obstetric care. The sums paid ranged from \$.50 to \$70. Six of the 390 confinements were among industrial policyholders of the Metropolitan Life Insurance Company. The total cost of their obstetric service was \$338.65, averaging \$56.44 per confinement. Only one was confined in a hospital at a total cost of \$103.65. The physicians' charges in these cases were \$50 apiece for 4 and \$35 and \$25 for the other 2.

The total cost of obstetric service to Berkeley mothers, in which at least one item of cost is represented, averaged \$213.75 per case. In half of the cases the charges were \$179.41 or less. The average calculated on the basis of the 390 cases, including patients who did not pay anything, would be reduced to \$206.07. It is safe to state that the total cost of the average obstetric case in Berkeley is somewhere between \$200 and \$215. In exceptional cases and especially those with complications, it may run to \$1,000 or even to \$1,800. The mean cost per case for nursing service was \$116.21 with a median of \$89.—The Cost of Obstetric Service to Berkeley Mothers, R. A. Bolt, *J. A. M. A.*, 94: 1561-1565 (May 17), 1930.

**The Suicide Record for 1929**—The suicide rate for American cities reached 18 per 100,000 in 1929, the highest figure on record since 1916. The tabulated results of 151 American cities with an estimated population of nearly 38,000,000 showed an increase in the rate from 16.9 in 1928 to 17.5 in 1929. Eighty cities showed an increase over 1928, 56 showed a decrease and in 15 the rate remained stationary. San Diego yielded first place to Sacramento but most of the Pacific Coast cities outranked all others in their tendency to suicides. The 7 cities and boroughs with more than 1,000,000 population showed the following rates: Manhattan and the Bronx, 27.8; Los Angeles, 18.1; Detroit, 18.1; Cleveland, 16.8; Philadelphia, 16.3; Chicago, 15.8, and Brooklyn, 14.3.

Of particular interest is the decrease in the suicide rate for Chicago from 18.1 in 1928 to 15.7 in 1929, while the rate for Cincinnati increased from 16.9 to 25.4. The rate for Denver decreased from 27.9 to 20.4, while that for Hartford decreased from 17.4 to 8.7, and New Orleans from 19.6 to 15.4.

The increase over 1928 was by no means as marked as had been expected after the business depression following the stock market collapse. This undoubtedly had a direct bearing on the increase in suicides but when the suicide rates for a period of years are correlated to business failures, there is a fair consistency in the correlation.

In 20 European countries with a population of 240,000,000, there have occurred 253,546 suicides from 1921 to 1927. The annual number has increased from 31,874 during the first year of the period to 40,527 during the last. The European suicide rate has increased from 13.3 per 100,000 in 1921 to 16.8 in 1927. In the U. S. Registration Area the actual number of suicides increased from 52,167 for the period 1919-1923 to 67,888 for the period

1924-1928. The suicide rate for the whole period (1919-1928) increased from a minimum of 10.2 in 1920 to 13.6 during 1928.

The suicide record for Finland dates back to 1751; the rate during 1751-1760 was 1.18 per 100,000, increasing gradually to a rate of 12.5 in 1918, then to 15.1 in 1925, and decreasing to 14.8 in 1926. Sweden's record begins with 1781, starting with a rate of 2.22 in 1781-1820, reaching 10.34 during 1881-1890 and 14.39 during 1921-1925.—F. L. Hoffman, *Spectator*, 124: 3, 18-20, 22 (May 22), 1930.

**Airplane Fatalities**—While deaths from airplane accidents have never attained much numerical importance in the United States, the latest data suggest that the time may not be far off when they will become a significant cause of death. In the U. S. Death Registration Area in 1928, airplane fatalities numbered 473, as compared with only 214 in 1927; and the death rate increased from 0.2 per 100,000 in 1927 to 0.4 in 1928. In California alone, the number of deaths increased from 27 in 1927 to 96 in 1928, and the death rate from 0.6 to 2.1.

The government statistical records for these accidents date back only to 1919, in which year 156 deaths were reported to the U. S. Bureau of the Census, with a death rate of 0.2 per 100,000. This identical death rate prevailed for 6 of the 9 years from 1919 to 1927. Then, in 1928, came a sharp rise.

The story of the mortality in airplane accidents is very different from that for automobile fatalities. Deaths from this latter cause began to attract the attention of vital statistics bureaus in 1906, when 183 fatalities occurred in the U. S. Registration Area, corresponding to a death rate of 0.4 per 100,000. Immediately, however, a sharp rise was observed. The mortality rate doubled in 2 years and tripled in 3; and in 10 years

it reached 5.9 per 100,000—substantially 15 times as high as in the first year for which records were kept. Obviously this rapid rise in the automobile death rate was due, in large part, to the rapidly increasing number of cars in use. The increase in airplanes, of course, has been a much slower process. Nevertheless, the sudden doubling of the death rate in 1928 suggests that, with more and more planes manufactured and used, the airplane death rate may be about to take a decided upward course.

More deaths from this type of accident occur in California than in any other state. In every year of the period from 1919 to 1928, without exception, the airplane death rate was higher in California than in any other state. A recent report of the U. S. Department of Commerce, nevertheless, accounts for the high mortality in California. This report shows that more than one-sixth of the licensed airplane pilots of the country reside in that state. The actual number is given as 2,244, against 1,153 in New York, 671 in Illinois and 640 in Texas. During the 10-year period, 1919-1928, there were 1,896 airplane deaths in the U. S. Registration Area. Of these, 332 occurred in California, 132 in Ohio, 106 in New York, and 105 in Illinois.

Complete data on airplane fatalities for 1929 are not available at this writing. The National Safety Council has stated the number of deaths in that year, from "civil aviation accidents" alone, as 485. When 91 fatalities in the Army, Navy and Marine Corps Air Services are added to this number, some increase, at least, will be shown over the previous maximum, as recorded for 1928.—*Stat. Bull.*, Met. Life Ins. Co., 11: 3-4 (May), 1930.

**Diphtheria Mortality in United States Cities, 1929**—A study of diphtheria mortality in 81 cities, all having a population of more than 100,000,

showed a steady decrease in diphtheria death rates throughout the country. The rate for the group as a whole was 7.69, the actual number of deaths, 2,698, being lower than that reported for many years. The northern geographic divisions experienced, for the most part, lower diphtheria death rates in 1929 than in 1928. The rate for the New England group showed a gratifying decrease from 8.59 in 1928 to 7.30 in 1929. The Middle Atlantic cities as a group, although including the largest population, had a lower diphtheria death rate than either the cities of the East North Central or West South Central states, and almost exactly the same rate as the New England and East South Central cities. The rate for the Middle Atlantic cities decreased from 10.80 in 1928 to 7.57 in 1929. The South Atlantic group showed the low average diphtheria rate of 4.70. The Mountain and Pacific cities had the lowest rate, 3.35, of any geographic division in 1929. The rate in the East North Central cities remained about the same, 11.30 in 1929, 11.29 in 1928. The groups of East South Central and West South Central cities both showed increases in 1929 as compared with 1928, the cities of the West South Central area manifesting a rather sharp rise in diphtheria mortality from 6.18 in 1928 to 9.17 in 1929.

Improvement in diphtheria mortality was noteworthy in New Haven, Hartford, Cambridge and Bridgeport. Jersey City, Utica, Rochester and Syracuse showed low 1929 rates. New York City continued its remarkable improvement. Baltimore and Atlanta both made new low records for 1929, 3.9 and 3.8 respectively. Cleveland also made a particularly good record of 3.9. Nashville had in 1929 its lowest diphtheria mortality (4.9) since 1924. The 1929 rates in Duluth, St. Paul and Minneapolis, 0.8, 1.0 and 5.6, respectively, were surprisingly low, considering the

severe climatic conditions which prevail in these cities. Seattle had the third lowest rate in the country, 0.5 in 1929.

Lynn and Fall River showed increased diphtheria mortality in 1929. The rate for Newark remained the same as in 1928, 20.0, and was the second highest in the country. Norfolk, which showed an increase, had the relatively high rate of 6.5 in 1929. Detroit showed an increase from 16.2 to 21.8, the highest 1929 rate in the country. Louisville, Birmingham and Memphis showed increases in diphtheria mortality in 1929 compared with 1928. Dallas, San Antonio, Chicago, Paterson, Springfield, Mass., and Camden were in the group with the highest diphtheria death rates in the country in 1929.—Diphtheria Mortality in Large Cities of the United States in 1929, *J. A. M. A.*, 94: 1838–1841 (June 7), 1930.

**Vital Statistics for Spain**—During 1929, there were 653,571 births in

Spain, giving a birth rate of 28.9 per 1,000 population compared with 29.7 in 1928. The excess of births over deaths was 246,150 against 253,068 in 1928, indicating that, at the present time, the population of Spain is increasing by about a quarter of a million per year. Infant mortality was 123 per 1,000 births in 1929 and 125 in 1928.

General mortality declined from 18.4 in 1928 to 18.0 in 1929. Decreases over 1928 were shown for tuberculosis all forms, 136.4 per 100,000 population in 1929 against 139.0; and cerebral hemorrhage and softening, 124.8 and 130.6. All communicable diseases showed decreased mortality rates. Heart disease increased from 163.4 per 100,000 population in 1928 to 168.9 in 1929; influenza, 15.4 to 24.3; pneumonia, 39.5 to 43.0; and other respiratory diseases, 147.2 to 160.0. Puerperal septicemia showed a decrease from 22.0 per 1,000 live births in 1928 to 20.0 in 1929.—*Pub. Health Rep.*, 45: 582–583 (Mar. 14), 1930.

## PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

**Overnight Camps**—Inspection of 170 overnight camps in New Hampshire revealed camps of many types, varying greatly in size and accommodation. An estimate places the number of accommodations at these camps for one night at 6,393. Included in the inspections, which were made under the general laws in regard to nuisances, there being no regulations as yet on definite standards for overnight camps, were water supply, toilet facilities, and general camp cleanliness. If dining rooms were attached, as was the case in 56 camps, the equipment for caring for the food was inspected.

The water supply in general was very good. In some instances suggestions were made for improvement. Of those that were analyzed only one was found dangerously polluted. In regard to toilet facilities, 17 camps had installed chemical toilets, 76 had provided flush toilets with proper sewage disposal, and the remainder, pit privies. Where necessary, need for improvement was called to the manager's attention. Managers, in general, welcomed inspection and suggestions.

The estimated investment of the bungalow villages is about \$150,000. Many of these have their own laundries, run-



ning water, electric lights, shower baths and modern conveniences. It is felt by the State Board of Health that no danger or menace exists in the tourist camp for the traveler.—Anon., *Health*, New Hampshire State Board of Health, Sept., 1929, pp. 2-5. (From *Public Health Engineering Abstracts*, Feb. 22, 1930. Abstr. F. O. A. Almquist.)

#### Progress in Water Purification—

The results of previous investigations on the problems of softening, recarbonation, flocculation and increased use of chlorine are described. The question of the pollution and self-purification of rivers is discussed. River pollution may be estimated by the oxygen demand. An electrical process for following the course of covered mains and a new American rustless iron pipe are described. Improvement in aeration technic has led to the removal of noxious gases, a considerable reduction in the amount of chlorine required, and better flocculation. The increasing use of sodium silicate and lime for the reduction of lead corrosion is dealt with.

Researches on the significance of pH values in softening and experiments with natural zeolite are mentioned. In connection with flocculation, the results obtained by the production of artificial turbidity for combating strong algal growths in raw water tanks are especially noticeable. The filter rate was considerably lengthened and, in the case of a residual turbidity of 100 mg. per liter, heavy flocs, which carried away further quantities of organisms, formed in the settling tank.

A good flocculation is said to be obtained by a new type of mixing plant, the operation of which depends on the gradual reduction of the water velocity to quite a small value. Useful experience with superchlorination has been obtained in Toronto; the greatest amount of chlorine used was 3 mg. per liter.—N. J. Howard, *Surveyor*, 75: 203, 1929;

*Wass. u. Abwass.*, 26: 173, 1929. (From Papers of Water Pollution Research Board, England.)

**Chloramines in the Disinfection of Water**—Various investigations of the formation of monochloramine, by the addition of ammonia or ammonium salts to calcium hypochlorite or chlorine, and its use in the disinfection of water are discussed. Details and tables of results are given of experiments carried out to determine whether the addition of ammonia or its compounds increased the germicidal efficiency of chlorine and, if so, under what conditions the efficiency was greatest. When the water was clear and of low organic content, the addition of ammonia with chlorine retarded the disinfection, except when the chlorine was in great excess of the ammonia. When small quantities of chlorine were used the final disinfection was less than with chlorine alone. In turbid waters of high organic content, the addition of ammonia increased the germicidal velocity of the chlorine.

There was no apparent loss of free or saline ammonia. The most effective ratios of chlorine to ammonia were not definitely determined, but in turbid waters of high organic content satisfactory results were obtained with the ratios of  $\text{Cl}_2 : \text{NH}_3$  of 1 : 2 and 1 : 3.

The chlorine-ammonia method is recommended for the treatment of raw unfiltered waters, especially if long periods of detention after chlorination are available. References to literature are given.—J. J. Hinman and K. C. Beeson, *J. Am. Water Works A.*, 21: 1705, 1929. (From Papers of Water Pollution Research Board, England.)

**Dechlorination of Water by Activated Carbon**—The author describes a series of experiments carried out to obtain practical knowledge of the working of an activated carbon filter for the dechlorination of superchlorinated wa-

ter. The first series of experiments described was of short duration carried out with fresh filter material. It was found that the percentage decrease in chlorine content for a given length of filter run and an equal speed of flow was independent of the original concentration of the chlorine. Increased speed necessitated increased length of filter. Different activated carbons (AKT II, III and IV and Urbain HAS 18) are classified by the length of filter run required to reduce the chlorine content of a water by one-half at a speed of 1 cm. per second and a method of calculating the size of filter required is described.

In further experiments continuing over a considerable time it was found that the life of the filter material without regeneration varied with the composition of the water. Regeneration investigations showed that treatment of the carbon either with a hot soda solution in the filter or by removing from the filter and heating to a dull red heat was successful.

"Fatigue" in the filter appeared to be due to the formation of a gelatinous membrane which was peptonized by the hot alkali, or contracted by heating. With a hard carbon the loss of material in regeneration should not be serious.

Experiments on a practical scale in superchlorination and dechlorination were made with a traveling "Dabeg" plant to test the possibility of a supply of Elbe water for Aussig, and on the very favorable results the decision to use Elbe water as a supplementary supply was based.

In the course of discussion the author stated that his calculations of the size of filter required held good for most natural waters but the presence of ammonia, by the formation of chloramine, lengthened the time necessary for dechlorination.—H. Pick, *Vom Wasser, Ver. deutscher Chemiker*, Berlin, 3: 71, 1929. (From Papers of Water Pollution Research Board, England.)

**Odor Control at the Macon Sewage Plant**—The Macon, Mo., sewage plant is located close to a residential district and serves a population of 3,500. It consists of coarse bar screen, Imhoff tank, sludge drying bed and sprinkling filter. For several years odor difficulties have arisen. The authors carried out an experiment on chlorination as a means of odor control during 4 consecutive days in midsummer. Hourly observations were made of the rate of sewage flow, applied and residual chlorine, hydrogen sulphide and odor at the filters and at a distance of 400 ft. from the filters. The treatment prevented odors and at a maximum dosage cost \$4.65 per m. g. The dosage depended on the time of the day and varied from 3.9 to 10.9 p.p.m. To avoid odors, a maximum of 1.5 p.p.m. of volatile hydrogen sulphide should not be exceeded.—W. S. Johnson and H. Bosch, *Pub. Works*, 60: 400, 1929.

**Living Tubercle Bacilli in a Septic Tank Effluent**—Inoculation experiments on guinea pigs showed that chlorinated septic tank effluent did not cause tuberculosis, while an untreated septic tank effluent aroused the disease in inoculated animals.

The tubercle bacillus therefore withstands not only acids, alkalies, and digestion processes, but also the septic processes in a septic tank.—S. L. Cumins, D. Davies, and C. M. Acland, *Tubercle*, 10: 310, 1929; *Zentralbl. f. d. ges. Hyg.*, 20: 409, 1929. (From Papers of Water Pollution Research Board, England.)

**Results of Tests on Sewage Sludge**—This bulletin gives an account of the objects, methods, and results of tests made at the experimental sewage testing plant of the Engineering Experiment Station of the University of Illinois. The plant itself, the sewage, and the method of supplying sewage to the

plant are described. Sludge digestion in deep and shallow Imhoff tanks was studied.

Sludge from a deep tank drained and dried better than that from a shallow tank and was of better quality. The shallow tank also accumulated more sludge, digestion apparently being slower, and had the disadvantage that sludge had frequently to be removed.

Tests on the effect of the addition of moisture to sludge on drying beds showed that well moistened sludge did not form a hard surface, and was more cracked and broken than unmoistened sludge. In almost every case, but especially with well digested sludges, the more moistened sludges showed a lower final moisture content and a greater volume reduction than less moistened sludges. It appears that covering sludge beds must therefore be ineffective in assisting drying and may even handicap the process by lack of ventilation.

Sludge frozen on the beds gave on thawing a very easily drained sludge, fine grained and easily pulverizable. The water content was less than with unfrozen sludge but the per cent reduction in volume was also less. It therefore appears advisable to draw sludge from tanks during winter months and also to remove frozen or semi-frozen sludge from beds to make room for more. In this condition it is easily transported and may be allowed to thaw and disintegrate at the point of final deposition. Activated sludge also drains well after freezing.

Efforts were made to find an expression for the relation between the factors affecting sedimentation and the per cent removal of suspended particles. Observations were made with coal and sand as sediment and with dilute and concentrated sewage. It was not found possible to formulate an expression for a relation between the different factors, but from tests in which all possible factors were controlled an empirical for-

mula was devised, expressing the relation between the different variables. With low concentrations, however, the per cent reduction of settling solids was found to be quite erratic.

Experiments on gas production in ordinary Imhoff tanks showed that the amount increased with the amount of sludge accumulating in the tank and with increase in temperature. The average quantity produced was about 0.3 cu. ft. per head per day. It is not practicable to heat Imhoff digestion chambers above the temperature of the incoming sewage because of the heat lost in the flow of sewage and disturbance of sedimentation by convection currents. Separate sludge digestion experiments carried out in a shallow Imhoff tank showed that it was advantageous to carry out digestion in two stages, the first in an upper compartment separated from the lower by a slot trapped against reverse flow of gas. The size and operation of such a tank are described. The rate of gas production was greatly increased by heating from 10° C. to 26° C.—H. E. Babbitt and H. E. Schlenz, *Univ. of Illinois Eng. Exper. Sta. Bull. No. 198*, 1929. (From Papers of Water Pollution Research Board, England.)

**2,300 Tons of Pollution Afloat in Manhattan Atmosphere**—An investigation by Professor H. H. Sheldon indicates that approximately 2,300 tons of foreign matter float in the Manhattan atmosphere. Professor Sheldon used a rather unique method in making the tests by measuring the amount of dust and dirt caught by the air conditioning systems in Broadway motion picture theaters. These systems, in addition to circulating the air, wash and humidify—or dehumidify—it. In this process, which is accomplished by water sprays, 96 per cent of the foreign particles in the atmosphere is removed. The test revealed that the 341,000,000 cubic feet

of air passing through the tanks contained  $11\frac{1}{4}$  cubic feet of dust and dirt. This ratio applied to the city's atmosphere gives 35,160 cubic feet, or 2,300 tons, as the amount of foreign particles in the air. Samples analyzed indicate that 65 per cent of these particles was unconsumed carbon, 15 per cent stone dust and mineral matter, and 20 per cent germs.—Anon., *Am. City*, 41, 2: 167 (Aug.), 1929. (From *Public Health Engineering Abstracts*, Feb. 22, 1930. Abstr. J. B. Harrington.)

**The Effect of an Alternating Electric Current on Tubercle Bacilli in Milk**—This article includes a description of experiments conducted by the author in treating raw milk artificially infected with tubercle bacilli in commercial apparatus designed to heat the milk almost momentarily to about 160° F. by passing a 220 volt, 60 cycle alternating current through it and cooling it as quickly as possible. The heating unit consists of 2 water cooled flat carbons 24" long and held 3" apart by hard rubber spacers. This forms a rectangular chamber 3" by 4" in cross-section through which the milk is pumped. The electrical input is constant and the temperature to which milk is heated is controlled by regulating the rate of flow by means of a hand controlled valve and by automatically varying the current in the field of the motor driving the centrifugal milk pump through the medium of a vapor tension bulb located in the milk line beyond the carbons. The milk is heated regeneratively from about 60° F. to 120° F. and then electrically from 120° F. to 150° F., 155° F., or 160° F., the temperatures used in the experiments.

Three experiments were run, one in July, 1924, one in November, 1925, and one in June, 1926. In the first experiment 50 gal. of milk inoculated with a large quantity of a culture of bovine tubercle bacilli was treated at 160° F., then 50 gal. similarly inoculated at 155° F., and then another 50 gal. of inoculated milk were treated at 150° F. Samples were collected at various points at the beginning and end of each run and injected into guinea pigs. The second and third experiments were run in the same way except that 100 gal. of milk were used for each run and human as well as bovine types of tubercle bacilli were added to the milk. The author reports that all the guinea pigs injected with inoculated raw milk and with milk preheated to 120° F. died from generalized tuberculosis or showed it at necropsy. Some of the guinea pigs after injections with milk treated at 150° F. showed either generalized or localized tuberculosis. The guinea pigs given injections with the samples of milk treated at 155° F. and 160° F. remained healthy and increased in weight.

The author states that "The electrical conductivity method of treating milk effectively destroyed tubercle bacilli with which milk had been artificially inoculated." He does not, however, say whether he believes the results to be due to some electrical effect in addition to heat, as the title might imply, or whether the same results might be expected by the application in some other form of the same degree of heat for the same length of time.—Charles M. Carpenter, *J. Infect. Dis.*, 44, 5: 347-356 (May), 1929. (From *Public Health Engineering Abstracts*, March 1, 1930. Abstr. Walter D. Tiedeman.)

# INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

**Report of Industrial Hygiene Committee: State and Provincial Health Authorities of North America, 1930**—A questionnaire was sent to the various state and provincial departments of health to determine the extent of industrial hygiene activities. It was found that, even in those states and provinces where the law requires reporting of occupational diseases, the large majority receive few or no reports of cases. In the states and provinces which compensate for occupational diseases under the schedule form, practically only those occupational diseases are reported which are compensated. In those states and provinces where all occupational diseases are compensated, the number of cases reported is woefully incomplete in the majority of instances.

Four departments of health have bureaus or divisions of industrial hygiene; 1 a bureau of housing and industrial hygiene; and 1 a bureau of industrial hygiene and factory inspection; 5 departments of health have a specific appropriation for industrial hygiene purposes; 4 departments have a laboratory for industrial hygiene; and 5 use laboratory facilities of the department of health or consultants.

With few exceptions, comparatively little work is being done by the health agencies in this country. Connecticut has prepared a working classification of industries and of hazardous materials, processes, and conditions. The industries are divided into about 100 groups, and the hazardous materials, processes, and conditions into about 70. This system provides an organization of our information on occupational disease exposures in the various industries in the states.

The control of occupational disease requires more than plant inspection. Before effective work can be done in this direction, it is neces-

sary that scientific methods, physical and chemical procedures be applied to the problem. For many materials, the minimal amount which will affect the health (threshold dose) is known, and it is only by utilization of these procedures that we can know definitely whether the exposure is below that limit. This necessitates a laboratory and technical assistance.

The minimum set-up for a division or department of occupational disease is a physician with a broad knowledge of occupational diseases and industrial environment, a chemical engineer, trained in industrial procedures, capable of making the necessary field determinations of gases, dusts, fumes or other materials or conditions that may affect health, a clerk and a laboratory. The laboratory must be specially equipped to make these determinations. This division should:

1. Secure and investigate reports of occupational diseases.

2. Make necessary field studies of workroom environment including special determinations of gases, dusts, fumes and toxic materials; air velocity, temperature, humidity, general ventilation, illumination, or any conditions or processes thought to be affecting health.

3. Provide a source of information for physicians, industry, or any agency interested in the cause, treatment, and prevention of occupational disease.

The committee found a certain amount of important work performed during the past year such as studies in sandblasting and silicosis, radium painting, lead poisoning, benzol and other poisonings, ventilation and illumination. Several states have adopted codes governing spray painting.

It is recommended that every effort should be made to increase the reporting of occupational diseases: that general practitioners should be further impressed with the necessity of securing complete occupational histories of their patients; that more time should be devoted in the medical school to the ef-

fect of occupation upon health; that surveys should be made of those industries in which potential hazards are known to exist in order to clear up the conditions causing occupational diseases; and that special laboratory facilities and technical personnel are required in this field.

There accompanies the report a list of hazardous substances, processes and conditions for coding occupational diseases, devised by the Connecticut State Department of Health. Likewise, a chart showing by states and provinces whether or not reports of occupational diseases are required; whether received by the health or labor departments or both; whether a reporting form is required; the number of cases reported annually for the 5-year period ending in 1929; whether or not a bureau of industrial hygiene exists and the personnel maintained; the appropriations made; laboratory provisions; and whether or not important legislation upon the subject exists and the same in regard to important regulations for 1929-1930.—Mimeographed Report distributed by the Connecticut State Department of Health, Hartford, June 10, 1930.

I. Classified Index of Occupations. II. Alphabetical Index of Occupations—These two volumes prepared by the U. S. Bureau of The Census for the 15th Census of the United States, 1930, have now become available for distribution. The Indexes are based upon the occupational designations returned at the previous three censuses with certain supplements.

The *Classified Index* which sells for 50 cents comprises 205 pages. It includes the subject of "repeater" occupations with their symbols, a grouping by industries with proper symbols, a brief industry index with symbols, and then an extensive alphabetical arrangement under the various industrial classifications also with symbols. The In-

dex enables one to find the various occupations which may exist in the given industries, trades and callings.

The *Alphabetical Index* is a volume of 527 pages, repeating in its fore part the industrial classification and industry index of the former volume, but devoted almost entirely to an arrangement of occupations in alphabetical order, a second column showing the industry and a third column the symbol to be used designating the given occupation.

The price of this volume is \$1.00.

Complete explanations for use accompany each volume.

The Indexes will be used by the Bureau of The Census in classifying the occupations returned on the population schedules at the 15th Census, and in classifying the occupations returned on birth and death certificates.

The Indexes were prepared by Dr. Alba M. Edwards, expert on occupations, under the general supervision of Dr. Leon E. Truesdell, chief statistician for population.

[Abstractor's comment: These volumes, arranged for standardization of terminology in occupations, should prove invaluable to all manner of offices, bureaus and persons dealing with occupations.]—U. S. Bureau of The Census, Washington, D. C.

Household Mechanical Refrigeration—This is Report 2 of the Committee on Poisonous Gases of the American Medical Association and has special reference to the toxicity of refrigerants used. The Report was drafted for the committee by Dr. Carey P. McCord, Cincinnati, O. There is a discussion of the systems of household mechanical refrigeration, a list of 44 substances that may be used as refrigerating mediums, and a statement of the objections to both the single and the multiple systems, the latter being potentially a far greater source of harm than the former.

The fundamental properties of an

ideal refrigerant are listed, such as non-inflammability, non-explosiveness, non-toxicity, absence of odor and of visible fumes, operation at low pressure, lack of corrosion, absence of deleterious effects on foods, etc. A second table shows the relative toxic properties for six of the commoner refrigerants used and there is a discussion of carbon dioxide, dry ice (solid carbon dioxide), silica gel, methane, ammonia, sulphur dioxide, ethyl chloride, and methyl chloride, with a considerable discussion of the literature on intoxication, particularly of methyl chloride.

Industrial poisoning from ammonia, sulphur dioxide, and methyl chloride, and the matter of the introduction of warning agents, refrigeration codes and moral obligations are discussed.

In part summary of the committee's position are these findings: Household refrigeration is a factor for good in the promotion of public health and economic living. For this reason no action or attitude is warranted that would tend to hamper the manufacture and use of safe refrigerators. Greater precautions, however, are called for. The introduction of warning agents *per se* (toxic or non-toxic) is regarded as not commendable. "This practice does not adequately provide protection for all classes of persons, including infants, locked-in children, the insane, the sick, or the aged." Codes governing the safe manipulation of refrigerants should attain uniformity through joint efforts under such auspices as the U. S. Public Health Service.

Every manufacturer of a product that may injure the user has a responsibility to try out and test all substances with harmful properties. The use of toxic substances without adequate safeguarding or warning should lead to penalties. "It is no longer to be tolerated that manufacturers procure information as to toxic substances through the deaths and illnesses of consumers." In connection

with the recent deaths from methyl chloride, sufficient medical and chemical data were already available to have prompted safeguardings. Unfinished and unpublished work indicates that a practical refrigerant is now promised which is sufficiently free from toxic properties. As with foods and drugs, a similar federal law and governmental supervision are needed in regard to possibly harmful substances.—Committee Report, A. M. A., J. A. M. A., 94, 23: 1832-1838 (June 7), 1930.

**Refrigeration**—It is estimated that 60 per cent of the families in the United States do not have proper refrigerating facilities in their homes. The methods of refrigeration involve either the use of ice or the evaporation of some highly volatile chemical substance which abstracts heat.

Among the essentials no harmful effects should result from the refrigerant used, either upon the food or by leakage into the rooms. A mechanical refrigeration system consists essentially of two parts—an evaporator and a compressor with adjuncts—and such systems are usually constructed as single units or so-called multiple systems (the latter in apartment houses, etc.).

The most common refrigerants used are sulphur dioxide and methyl chloride, but domestic use is also made of ammonia, carbon dioxide, and ethyl chloride. There are advantages and disadvantages to all of these, particularly in relation to their toxic qualities or, as in the case of carbon dioxide, to the excessive pressure—700 to 900 lb.—under which they are used. (The properties of sulphur dioxide and methyl chloride are briefly summarized.)

Leaks in mechanical refrigerating systems are common. Investigations made by the Department of Health during recent months disclosed 190 leaks; of these, 152 were in multiple systems, and 38 in single units. Leaks were

found of nearly all of the common gases used, sulphur dioxide being the most frequent, with 82 leaks; and methyl chloride the next, with 77. Leaks in multiple systems are much more common than is ordinarily supposed, and on this account a legal code of specifications is essential. Ten deaths have been definitely attributed to the escape of poisonous refrigerant gases into places of human habitation.

Leaks of sulphur dioxide are readily detected from the characteristic pungent odor and suffocating effect, but the gas may be tested for with ammonia fumes, when a white cloud is formed at once. In the case of methyl chloride there is no simple way for the householder to know whether a leak has occurred, so that the Department of Health should be notified at once when a leak is suspected. Dr. Julius Stieglitz of the University of Chicago recommends a test apparatus consisting of an alcohol lamp with a fine copper mesh screen around the flame. In the presence of methyl chloride, the flame turns a greenish color.

A number of precautionary measures are described.—Arnold H. Kegel, *Chicago's Health*, 24, 23: 126-132 (June 10), 1930.

**Diagnosis of Silicosis**—In a disputed case of silicosis in which the post-mortem examination when held showed that the man had died of silicosis, the Home Secretary (Mr. Clynes) replied that the diagnosis during the workman's lifetime had been confused with anthracosis, making it one of peculiar difficulty, and that the case afforded a very good illustration of the need for improved medical arrangements by the setting up of an expert medical board, and such steps are now being undertaken for the Workman's Compensation (Silicosis) Bill.—Parliamentary Intelligence, *Lancet*, 5572: 1320 (June 14), 1930.

**Sixth International Congress for Accident Surgery and Labor Medicine**—This Congress is to be held in Geneva, Switzerland, August, 1931, the last one being held in Budapest, September, 1928. The principal questions to be discussed are the following:

- I. Slow Results and Evolution of Traumatic Wounds of the Spine
- II. Traumatism of Blood-Vessels (Arteritis and Thrombophlebitis)
- III. Cutaneous Infections in Relation to Labor Accidents
- IV. The Previous State in the Consequences of Labor Accidents

In addition to these topics, others of particular interest in the field of industrial medicine will be scheduled. Authors will also be permitted to submit special subjects.

An exposition of radiographs, photographs, and mouldings, etc., will be held. Those wishing to exhibit should apply to Dr. Jentzer, Geneva, rue de l'Université 8.

The President of the Organization Committee is Professor Julliard, Geneva, and the General Secretary, Dr. Yersin, 3, rue de la Monnaie, 3, Geneva.

The American members of the Permanent International Committee are: Dr. Fred H. Albee, New York, N. Y., and E. R. Hayhurst, Columbus, O. The official delegates from the United States to the last Congress (Budapest), in addition to the two above named, were Dr. Francis D. Patterson, Philadelphia, Pa., Dr. Francis D. Donoghue, Boston, Mass., and Dr. D. J. Prather, U. S. Public Health Service. The American Committee for the Sixth Congress is now being organized.

**Organic Fluorides as Refrigerants**—Irrespective of otherwise satisfactory engineering and thermodynamic properties, all refrigerating agents previously used have been either inflammable, toxic, or both.

This paper covers a new class of re-



frigerating agents—organic substances containing fluorine. Some of them are surprisingly non-toxic. Dichlorodifluoro methane is less toxic than carbon dioxide, as non-inflammable as carbon tetrachloride, and very satisfactory from every other standpoint. Its toxicity has been studied by the U. S. Bureau of Mines and the results are included. (See Abstract, *A. J. P. H.*, 20, 7: 780 (July), 1930.)

A method of correlating the properties of this class of substances is presented, and the method of manufacture of dichloro-difluoro methane is described. The article is accompanied by two charts and one illustration.—Thomas Midgley, Jr., and Albert L. Henne, *Indust. & Eng. Chem.*, 22: 542 (May), 1930.

**A Study of Silicosis in Rock Drillers**—The author describes the findings of the committee organized by the New York Tuberculosis and Health Association to make a study of the hazards of rock drilling in Manhattan which was carried out by the association in connection with the Vanderbilt Clinic

of Columbia University and the Metropolitan Life Insurance Company, during 1928 (see *J. Indust. Hyg.*, Feb., 1929). Following this study official and non-official agencies held a conference designed to lessen the dust hazard. Tests of a dust collection system were made which showed an efficiency such as to reduce 423,900,000 particles to 23,000 per cu. ft. minimum. The U. S. Public Health Service has adopted as a permissible limit 10,000,000 particles under  $10\ \mu$  per cu. ft. Thus it is not necessary to remove 100 per cent of the dust.

A very valuable discussion follows the above paper by those present at the Buffalo, 1929, meeting of the International Association of Industrial Accident Boards and Commissions, part of which devolved around the Ontario Silicosis Law—which provides that there must be an exposure to silica for 5 years before a workman is entitled to compensation, during which time the exposure must be in Ontario.—A. J. Lanza, *Proceedings of the 16th Annual Meeting of the Internat. Assn. Indust. Accident Boards and Commissions*, Bull. No. 511, U. S. Bur. Labor Statistics, Apr., 1930, pp. 40–47.

## FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

**The Blacktongue-Preventive Value of Lard, Salt Pork, Dried Green Peas, and Canned Haddock**—In a former experiment (Abstract, this JOURNAL, 28: 1183 (Sept.), 1928), the blacktongue-preventive action of 16 selected foodstuffs was reported. The study here reported was made on pork lard, salt pork, dried green peas, and canned haddock. The same general procedure was followed as in the previous experiments.

Details are given as to feeding experiments, symptoms, etc. Results indicate that lard and salt pork are poor sources of the blacktongue preventive. Canned haddock contains the blacktongue-preventive factor and when used in large proportions the clinical manifestations of blacktongue are prevented. Dried green peas contain the blacktongue preventive, but in small amounts.

Fifty or more of the test animals on lard, salt pork and haddock diets showed

postmortem evidence of fatty degeneration of the liver.—Joseph Goldberger, G. A. Wheeler, L. M. Rogers, and W. H. Sebrell, *Pub. Health Rep.*, 45: 1297 (June 6), 1930.

Vitamin A and Carotene. II. The Vitamin A Activity of Red Palm Oil Carotene. III. The Absence of Vitamin D from Carotene. IV. The Effect of Various Dietary Modifications upon the Vitamin A Activity of Carotene—Carotene from various sources has shown vitamin A activity in the hands of certain investigators, but other pigments such as xanthophyll, lycopin, and the like, have been reported deficient in growth promoting powers. The unsaponifiable fraction of red palm oil has been studied and a method given for extraction of the carotene. Colorimetric determinations were made of the unsaponifiable matter in the isolated pigment in oil solutions both for the natural yellow and the color evolved with antimony trichloride.

In the biological tests on rats growth curves show that 0.01 mg. of the pigment was sufficient to restore growth in 2 rats compared to 0.2 mg. of the unsaponifiable concentrate paralleling the activities of carotene in unsaponifiable matter derived from carrots.

Other investigators have indicated that carotene does not possess antirachitic power. In confirming this young rats were placed on rachitogenic diets and various doses of carotene in peanut oil were administered daily for 35 days when they were autopsied and their bones examined. Results showed that carotene would not prevent rickets at a level of 100 times the minimal dose for vitamin A.

To determine the effect of dietary modification in carotene feeding two experiments were run; one group of rats received a basal diet of 15 per cent peanut oil and in the second group this was substituted by rice starch. A few of

the rats received vitamin D as irradiated ergosterol. At cessation of growth carotene was administered at the 0.01 mg. level dissolved in peanut oil for 1 group and in paraffin for the group on the fat-free diet. Carotene restored growth in all cases although it was least effective where paraffin was the vehicle.

In the second experiment one group received the fat diet with vitamin D and the second group the fat-free diet without vitamin D, and at the cessation of growth carotene was administered at the same 0.01 mg. level. Similar responses in both groups indicate the activity of carotene in the absence of fat in the basal diet.—Thomas Moore, *Biochem. J.*, 23: 1267, 1929.

Bacteria of the Upper Respiratory Tract and Middle Ear of Albino Rats Deprived of Vitamin A—An investigation is reported in which a study was made of the relation of avitaminosis (A type) to bacterial invasion of the nasal cavities and middle ear. A bacteriological study of the nasal cavities and middle ear in 79 albino rats is presented for 4 groups: normal stock rats, vitamin-A-deficient controls, rats on a vitamin-A-free ration which developed xerophthalmia, and those on a like diet which did not develop the disease. Four types of organisms pathogenic to rabbits were isolated. These are classified as *Staphylococcus aureus*, *B. coli*, *M. catarrhalis* A, and *chromogen* 6, the last two being gram-negative cocci. From observations it was quite apparent that the pyogenic gram-negative cocci, especially *chromogen* 6, are encountered more frequently in the animals which show the most severe symptoms of vitamin A deficiency. It is indicated that these organisms gain a pathogenic hold during the depressed state of their host resulting from vitamin A deficiency. Some evidence is given that cod liver oil protects against bacterial invasion of the nasal cavities and middle ear.—R. G.

Turner, Dorothy E. Anderson, and E. R. Loew, *J. Infect. Dis.*, 46: 328 (Apr.), 1930.

**Brucella Agglutinins in the Blood and Milk of Cows**—Observations over a period of years are reported on the correlation of specific agglutinins for *Brucella* species in the blood and milk of cows. Two herds of 91 and 81 animals respectively served as the basis for these observations. In both herds it was observed that the disagreements between the blood and the milk agglutinins consisted largely of negative reactions in milk serum when the blood serum of the same animal was positive.

It is concluded by the authors that a negative agglutination test with milk serum is not a reliable indication of the *Brucella* agglutinin content of the blood of the same animal. Agglutination with the milk serum detected from 47 to 68 per cent of the cows in two *Brucella* infected herds whose blood serum reacted. These observations tend to confirm the generally accepted limitations of the milk serum test for *Brucella* agglutinins in the diagnosis of this infection in cattle.—Robert Graham and Frank Thorp, *J. Infect. Dis.*, 46: 260 (Mar.), 1930.

**Beef Extract as a Source of Vitamin G**—A series of experiments are reported for the purpose of determining the relative amounts of growth promoting vitamin G (pellagra-preventive) in commercial beef extract obtained from different manufacturers. Relative amounts of vitamin G were estimated by feeding tests with young albino rats using samples of beef extract from five different sources.

Fresh lean beef was examined for comparison. It was found that an intake level of 7.5 per cent of moisture-free beef extract from each of four establishments furnished sufficient vitamin G for good to excellent growth in rats. The same percentage of beef extract

from the other establishment promoted only fair growth. In these experiments the average daily intake of moisture-free beef extract was approximately 0.80 gm. for males and 0.65 gm. for females. Twenty per cent of dried lean beef furnished sufficient vitamin G for fair growth and 25 per cent enough for excellent growth in rats.

The average daily intake of 25 per cent dried beef amounted to 2.7 gm. for male and 2.2 gm. for female tests. One pound of moisture-free extract appeared to contain approximately the same amount of vitamin G as 3.4 pounds of dried beef. Therefore, if the commercial products are compared, 1 lb. of concentrated beef extract contained approximately the same amount of vitamin G as 11 lb. of fresh lean beef.—Ralph Hoagland and George C. Snider, *J. Agri. Res.*, 40: 977 (June), 1930.

**The Oxalic Acid Content of Vegetables Used as Greens**—This study was made to compare the oxalic acid content of spinach with that of other leafy vegetables used as greens. The vegetables used were obtained in the open market during the summer of 1928 and 1929. Three different lots of spinach bought at different times were analyzed.

One sample of New Zealand spinach was used and two varieties of mustard were used. In addition, beet tops, turnip tops, kale and dandelion leaves were used. After cleaning and removing roots and stems, the remaining portion was washed, the surplus water dried off, and the fresh weight determined, after which they were dried to constant weight at a temperature of 80° to 85° C. The dried vegetables were then finally pulverized.

A modification of the Bau method for determining total oxalic acid content of coffee, tea, spices and vegetables (*Z. Nahr. Genussm.*, 40: 50-66, 1920) was used.

Tables are given showing the results of this experiment. The oxalic content of spinach, while varying in different samples, was much higher than is generally supposed, ranging from 0.486 to 0.692 per cent. Beet greens contained an amount equivalent or slightly higher than spinach and New Zealand spinach was found to contain considerably more. Dandelion greens, kale, turnip greens and mustard greens contain no oxalic acid. In view of the unexpectedly high percentages of oxalic acid in spinach it is worthy of note that large quantities of this vegetable are consumed apparently without adverse effects on health.—Alice E. Ryder, *J. Home Econ.*, 22: 309 (Apr.), 1930.

**Cows Infected with Streptococcus Epidemicus (Davis)**—Over a period of 4 years the authors have investigated 17 cows which were found to be shedding in their milk *Streptococcus epidemicus* (Davis). The milk from 2 of the cows was associated with an epidemic of septic sore throat among consumers. The other 15 cows were giving milk which was mixed with a considerable quantity of other milk and used as food. No clinical symptoms of epidemicus infection were produced among the consumers of the milk from these cows. In none of these cases have the authors been able to establish any relation between a streptococcus throat infection in those who handle the cows. It was concluded that in most cases there is a probability that the cows were infected before they were brought to the farms where the infections were discovered.

Eight of these cows were found in certified herds of approximately 1,200 cows which have been regularly tested at monthly intervals. The other 7 were accidentally discovered in small herds.

As a result of their investigations, the authors indicate that the cows infected with *Streptococcus epidemicus* are rather generally and widely distributed

and that this streptococcus undoubtedly occurs quite generally and frequently in milk used for direct consumption as well as that used for cheese and butter making without producing disease. The infection of cattle with this human type of streptococcus apparently begins as a mild disease which may become very severe or apparently continue a mild course.

There is a tendency for the infected portions of the udder to lose their milk secreting functions. In the group of mild cases to which most of the cows involved in this investigation belong, there is little or no change from the normal in either the udder or the milk, although *Streptococcus epidemicus* may be shed in large numbers.

Of the 13 cows in which the extent of the infection was determined by the investigators, 7 cows, 53 per cent, were infected in only one quarter, 4 cows, 31 per cent, were infected in two quarters, 2 cows, 16 per cent, were infected in three quarters, although the infection in the different quarters did not always occur simultaneously. The strains of *Streptococcus epidemicus* which were isolated are apparently all virulent and are identical with those strains isolated from epidemics from either man or cow.—W. D. Frost, R. C. Thomas, Mildred Gumm, and F. B. Hadley, *J. Infect. Dis.*, 46: 240 (Mar.), 1930.

**Vitamin C Content of Three Samples of Japan Green Tea**—The present work is a continuation of that previously reported (Abstract, this JOURNAL, 19, 11: 1262 (Nov.), 1929). Since only one sample was used in the first experiment and no attempt was made to determine whether the tannin might have been responsible for the results, it was thought advisable to make a more complete study. One strong tea infusion was made with enough water added to bring the final volume up to 100 c.c. instead of 125 c.c. In all other

and a watch or warning letter sent home to the parents.

2. Educate the community to avoid contacts, and teach sanitation and personal hygiene. The public health nurse is one of the front line troops—she should provide explicit information to the mother regarding immunization, and she should give only *approved*, given 6 times a week. *Tea* is given of the changes in weight and scurvy symptoms in guinea pigs.

Of the animals given the weaker infusion of tea, 3 survived the full 90-day test period, one died on the 83d day and all showed mild symptoms of scurvy at autopsy. The animals fed the strong infusion lived to the 80th and 81st day and scurvy symptoms were slightly more severe than those of the first group.

time she should be carefully examined. The entrance physical examination is not sufficient, or periodic examination is not enough for finding tuberculosis. Eight out of every 100 are missed with the regular physical examination. *T* in every case where the tea infusion was fed in conjunction with cabbage the animals grew well and showed no signs of scurvy. It was concluded that the symptoms observed in the guinea pigs receiving tea infusion as the only test food must have been due to the lack of vitamin C and not to a poisonous effect of tannin.—Hazel E. Munsell and Charlotte H. Miller, *J. Home Econ.*, 22: 314 (Apr.), 1930.

## PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.\*

**Canada Has This Problem, Too—** The present opportunities for service and development in the public health nursing field are not generally enough recognized by the large group of nurses graduating every year from the nursing schools. Dr. May Burgess, Director of the Committee on the Grading of Nursing Schools in the United States, says that of the nurses who have been graduated less than a year about 7 per cent hold public health positions, 24 per cent hold institutional positions, and the other 69 per cent are in the field of private duty.

Recent graduates drift naturally into private duty nursing or institutional nursing because they are more familiar with these types, because they usually require no further preparation, and because the nurses want to become self

supporting quickly. It takes an adventurous type of girl to look forward to going out into a community alone to do public health work, and her nursing school experience has not given her much chance to develop initiative.

The nursing superintendent and her assistants cannot always give much time to individual guidance during the nurses' training, but they should know that there are certain times in the year when many private duty nurses are unemployed, whereas a qualified public health nurse is practically sure of steady employment. More continuous effort is needed to give information on public health nursing to nurses in training. If an affiliation with a good public health nursing organization is not possible, workers from public health nursing agencies could be brought in at times to interpret their work to the senior nurses, the hospital administrative staffs and alumnae associations.

\* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

# EDUCATION AND PUBLICITY

EVART G. ROUTZAHN\*

health nursing in Canada are not getting enough well qualified applicants; during the year only 64 nurses graduated, and several times this number could have been placed. This means that nurses less qualified must be gotten to fill the positions that are opening.

The economic side presents difficulties, but any girl who has a real desire to become a qualified public health nurse usually gets there. There is great need of scholarships, however, for a public health nursing course does take more money.

Often too much is expected of the university public health nursing course. Every nurse graduating from one cannot be an expert in every type of public health nursing. All she has gained is an insight into the possibility of each, and before she can really do effective work she should have practical experience under nursing supervision. Medical supervision is not enough.

Two ways of meeting this situation (too little field work experience) would be either through the universities withholding certificates until a definite period of field work has been accomplished, or having the organization proposing to employ a nurse accept her on an instructive basis and at a lower salary for a period of time until she is better able to assume additional responsibility. With the demand for their services this safeguard has not been taken sufficiently into consideration.

—Elizabeth L. Smellie, *The Problem of Securing Recruits for the Public Health Nursing Field*, *Canad. Pub. Health J.*, XXI, 5: 240 (May), 1930.

**Of Interest to School Nurses—**  
The greatest need today is to perfect school health programs. Health education is at the crossroads. What we need more than propaganda and moti-

courses or study that are graded; (2) training of classroom teachers; (3) training courses at normal schools; (4) summer school classes; (5) health score cards that are used and get results; (6) tests and measurements; (7) educational objectives linked with projects that result in achievement; (8) recognition of health education as an integral part of the curriculum.

To achieve a better health education program in the schools, the following criterions are essential: (1) adequate facilities, (2) sufficient time allotment, (3) trained personnel, (4) recognition and credit, and (5) better programs.—James Edward Rogers, *What Can the Volunteer Agency Do to Assist State Departments of Education to Obtain Adequate Supervision of Health Training?* Abstracts of papers presented at 26th Annual Meeting of the National Tuberculosis Association, Memphis, May 7–10.

**Heard at the Biennial Nurses' Convention at Milwaukee in June.**

**Communicable Disease Control—**Every nurse is a communicable disease nurse. Her first duty is to know the local laws. She has no responsibility to diagnose, but if she cannot give her suspicion of a diagnosis it is a sad reflection on her intelligence.

Ways to check the spread of communicable disease:

1. Through the schools. The health department should have a physical inventory of every individual in the community.

- (a) The teacher should list the diseases of each child and get some idea of how far an outbreak may progress.

- (b) Non-immune children should be sent home if there is an outbreak of communicable disease, isolated for a required number of days,

and a watch or warning letter sent home to the parents.

2. Educate the community to avoid contacts, and teach sanitation and personal hygiene. The public health nurse is one of the front line troops—she should provide explicit information to the mother regarding immunization, and she should give only approved, not debatable information.

—John J. Sippy, M.D., District Health Officer, San Joaquin Local Health District, Stockton, Calif., Communicable Disease Control.

*Tuberculosis*—In a study made in the hospital nursing schools in the Twin Cities 20 per cent of the pupil nurses reacted positively to the tuberculin test on entering, and 100 per cent reacted on graduating. In a similar study made in the ordinary schools 2 per cent of the entering students showed a positive reaction to the tuberculin test, and only 30 per cent of the graduates had a positive reaction. Of the 543 nurses receiving aid through the Relief Fund of the American Nurses' Association 258 have tuberculosis.

How do student nurses become infected?

Not through overcrowded living conditions. This in itself cannot cause tuberculosis; and not through overwork if there is a proper amount of rest.

The nurse does not report when ill or her illness is considered minor. At this

time she should be carefully examined. The entrance physical examination is not sufficient, or periodic examination is not enough for finding tuberculosis. Eight out of every 100 are missed with the regular physical examination. ~~There~~ <sup>They</sup> should be an X-ray and a tuberculin test.

One explanation of the high incidence of tuberculosis among nurses:

They are exposed to tuberculous patients. General hospitals accept tuberculosis patients daily though they are supposedly not admitted. The nurse can accomplish much and control the situation if all cases are regarded and treated as communicable disease problems.

The following rules would help the situation:

1. Every pupil nurse should have a routine X-ray and tuberculin test.
2. Every patient should have an X-ray and a tuberculin test. Only 1 case in 500 would then be missed.
3. Every hospital should reserve space for its tuberculous patients.
4. Nurses should be trained to care for tuberculous patients—there would then be better qualified public health nurses.

—J. A. Myers, M.D., University of Minnesota, Minneapolis, Minn., Tuberculosis. (Extracts from the notebook of Henrietta Landau, R.N.)

## Recruiting

THE attention given in nursing magazines to recruiting students suggests that professional health work might claim more of the best of our college students if some one would lead the way in promotion effort to that end.

In "This and That in Nursing Edu-

cation and Practice," by E. E. Cortright, a group of working ideas are offered for taking "the necessary measures to produce an intelligent public opinion on the facts in training schools as they are operated today."—*Am. J. Nurs.*, May, 1930.  
E. G. R.

# EDUCATION AND PUBLICITY

EVART G. ROUTZAHN\*

**A Public Health Nurse Informs Her Public**—The *Monthly Bulletin*, Indiana State Board of Health (May, 1930), tells how a committee of five conducted a county public speaking campaign. In conclusion, the article states:

The results of this tour have been far-reaching. News stories, bulletin board material, posters, public group meetings, suggestions and general follow-up visits made by the nurse—all receive far more intelligent attention now that the public has been systematically informed—in advance. Then, too, the eleven evening trips helped the five members of the committee become better acquainted with each other and with each other's common problems. A splendid foundation has thus been laid for a lasting spirit of understanding and coöperation between the school, agricultural, tuberculosis, medical and nursing groups and the entire country.

**"Telling Marie Over the Telephone"** (*Red Cross Courier*, Washington, D. C., June 16, 1930. *Free*)—A monologue was given at an award of certificates to a home hygiene class:

On the speaker's stand stood a telephone receiver, and when the signal bell rang an honor student answered it to talk to a "friend." . . . "Hello! Marie! How are you? I'm fine. Well, Marie, I am glad you called me. I want to tell you about my Red Cross Home Hygiene class. You know I have told you several times special things I have learned in this class. Now I am through with the lessons and the American Red Cross is giving me a certificate—it's so pretty, with a Red Cross on it—and it means that I am better able to keep the family well, or to help them get well if they do get sick, than I was before. Goodness, Marie! I have learned the most things. I can make a nice, comfortable bed. . . .

\* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

**Health Education Pioneer**—The recent appointment of President Livingston Farrand of Cornell University as head of a special commission to study the possibility of increasing public health effectiveness in New York State reminds one that President Farrand was a pioneer in recognizing and encouraging the popular methods of health education of today. Under his administration of the National Tuberculosis Association there was carried on the first widespread service of public health information to the newspapers of the country.

**Publicity Exhibits at Fort Worth**—Space limits and hanging facilities make it uncertain how much or what kinds of publicity material it will be possible to display at Education-Publicity Headquarters at the Annual Meeting of the American Public Health Association.

Unusual forms and sizes are difficult to display. Groups of small items should be placed in a portfolio or scrapbook and not mounted on large cards. Three dimension material is desirable, but it is especially important that arrangements for space should be made in advance. An interesting display sent from New York to Minneapolis arrived without a plan or instructions. It could not be shown and was difficult to re-ship.

The only way in which a good exhibit can be planned is to select from available material what is best adapted to space and circumstances; so will you please write well in advance to the Editor of this department telling what you have to show which might help other health workers with their educational



publicity. You will receive a reply about October 1 stating when and where to send the exhibit, if there is space for it.

**A Proposition for National and State Agencies**—It is not possible through the resources of the Public Health Education Section to compile nearly so many collections of educational material as would be useful at the A. P. H. A. Annual Meetings. Workers are eager to examine collections of material from their specialized fields in addition to those collections which illustrate good practice in the preparation of different forms of publicity whatever may be the subject matter.

Could we have the active coöperation of national and state health groups?

Suppose the American Heart Association should make up a portfolio (or several of them) of its own newest and best educational and publicity material—together with that issued by state and local groups?

And then if other nationals would do likewise in their specialized fields?

The collections could include news releases, newspaper clippings, radio talks, bulletins or house organs, folders, etc., and of course lists of available educational material, material about the organizations and the services they offer.

Probably such collections should be displayed at the several headquarters of the nationals at Fort Worth—and afterwards be available at the home office of each national. A classified group of portfolios shown at the recent convention of the nursing organizations aroused so much interest that five additional sets are being prepared for loan to local agencies.

A somewhat different plan might be carried out by a state department or association. This would be a portfolio, or several of them, made up of the educational-publicity material of all types

issued by departments and associations throughout the state. We hope that Texas and several other states will prepare such displays for Fort Worth.

*If you like the idea help it along by urging it upon your national and state agencies.*

A memorandum describing how to make up portfolios will be supplied by the editor of this department.

**Social Hygiene in a Y. M. C. A.**—“An adequate program of sex-education information that will give the secretarial staff an up-to-date scientific knowledge of how to deal with this subject” was requested by a Y. M. C. A. The reply from the American Social Hygiene Association is supplemented by suggestions for dealing with groups reached by the Y. M. C. A.—“From a Young Men’s Christian Association.” *J. Social Hyg.*, 370 7th Ave., New York, N. Y., May, 1930, pp. 303–309. Something to be brought to the attention of your local Y. M. C. A. One working idea could be carried out by any interested organization:

Coöperate with the city libraries:

In choosing and securing for library circulation enough of the best sex education literature, and advertising its availability, in the community, in suitable ways.

In eliminating from circulation all out-of-date and undesirable material. This second item is fully as important as the first. Most libraries still carry many publications that are crude, misleading stuff. Perhaps two-thirds of the popular sex literature on the market at the present time is undesirable; hence intelligent discrimination is urgent.

**Remember the Guest Editor**—When you read this the year-round editor will be east of the Atlantic. For consideration in writing copy for this department to appear in the October issue please send your specimens and ideas—not later than August 25—to Dr. H. E. Kleinschmidt, National Tuberculosis Association, 370 Seventh Avenue, New York, N. Y.

Again the Annual Meeting!—Again it is a privilege to invite those concerned with any phase of educational publicity to use to the utmost the resources of the Public Health Education Section of the A. P. H. A. in connection with the annual meeting in October.

Here is hoping that the "Big Boss" will surprise you by proposing that "for the good of the order" you should begin planning to go to Fort Worth in October!

You might prepare the way by making up a list of the questions you would like to have answered and the topics you would like to discuss with fellow workers.

Last October at Minneapolis we had a group of portfolios containing educational and publicity materials which were classified under the following topics: cancer, children—schools, diphtheria, health examinations, heart disease, diet and weight, rural sanitation, summer warnings and advice, winter warnings and advice.

If you will send your 1929–1930 popular educational material on these topics it will be added to the display at Fort Worth. Please use this full address: Fort Worth Portfolios, Evart G. Routzahn, 130 East 22d Street, New York, N. Y.

**The Public Health Worker's Vacation**—Paul Sartorus, discussing "The Advertising Man's Best Vacation," quotes Abraham Lincoln:

"For myself, I feel—though the tax on my time is heavy—that no hours of my day are better employed than those which bring me again within the direct contact and atmosphere of the average of our whole people." After describing his "promiscuous receptions" which occurred twice a week, Lincoln continued, "I call these receptions my *public-opinion* baths! . . . and the effect, as a whole, is renovating and invigorating to my perceptions of responsibility and duty."

Sartorus tells of various advertising men who use vacation to get new con-

tacts with people and things. The flivver and tourists' camps did the job for one man. Another man goes into a new section of the country every year. The four chief men in one agency each go into a new section annually. One man spent the summer on a mid-western farm—and has done better work on farm paper copy ever since. When one does not wish to get far away from people, to get somewhere among "average" people and into some new life setting is urged for the one who is to plan or to write advertising (or health) copy. *Advertising and Selling*, 9 East 38th Street, New York, N. Y., June 25, 1930. 15 cents.

**What? When? Who? Why?**—What questions would you like to have answered? What problems solved? What methods worked out? What topics in health education-publicity should be talked over in print or in conventions?

The editor of this department is making a collection of questions and topics—big and little—easy and hard—which might be answered in some meeting, or be the topic for a meeting, or be handled in this department.

Send what you have now. Send others at any time.

**What About Billboards?**—Health agencies and churches seem to be the chief non-commercial users of outdoor billboards. Notwithstanding the vigorous propaganda against billboards from several quarters, but little direct opposition has heretofore been directed specifically to the church and health people for their outdoor posting, but the E. D. C. forces have met enough criticism this year to lead health workers to a consideration of the problem.

What are the objections to billboards? Are the objections general, or are they qualified by certain conditions? In so far as the objections are valid, must

they prohibit health workers from the use of billboards? Are billboards a useful medium for popular health education? What are the principles upon which health agencies should base their discussions for or against billboards?

What ideas have you on the subject?

#### HEALTH "BEST SELLERS"

Child Health Day brought much further use of *The Child's Bill of Rights*, by President Hoover. This is probably the most frequently published and most widely distributed health propaganda in this country.

The pamphlet on *Consumption*, by Dr. A. Knopf, published in that period before the Great War in which some recent writers have urged that little or no health education was known, is probably the health publication issued in more languages and more countries than any other.

But the genuine "Best Seller" among health books is *Diet and Health*, by the late Dr. Lulu Hunt Peters. For about 2 years this book was among the 10 "best sellers" in non-fiction titles, frequently topping the list. It was displaced only with the coming of *The Story of Philosophy*, and its kindred group of phenomenal non-fiction sellers.

A lightness of touch in writing, with a rare perception of the points of view of the lay reader and his difficulties in carrying out health and medical instructions, drew a great audience for Dr. Peters, whose recent death was a serious loss to popular health education.

#### BELIEVE IT OR NOT

The house organ of a tuberculosis sanatorium carried on its cover page a picture in color—a hospital interne rescuing a nude woman from the clasp of an energetic skeleton! Possibly an inspiration to the professional audience to which much of the publication is addressed—but who knows?

A well-written pamphlet, making an

impressive plea for the support of a state association, carries an application blank without the address to which it should be sent. On the back appear the individual addresses of all members of the executive committee but no hint as to which one should receive the application. When the signer hesitates, he is lost—usually.

#### EPITAPH

Here lies James,  
Though feeling poorly—  
He paid no doctor  
Prematurely.  
Also—post mortem  
Diagnosis  
Showed arterio-  
Sclerosis.  
How much more pleasant  
My narration  
Had James a  
Health examination!—*Jean Pinney.*

#### A REQUEST

Copies of posters and other material, as well as suggestions helpful in preparing a health exhibition, will be appreciated by Dr. Samuel de Madrid, Professor in the Popular University at La Boca, Buenos Aires. Address: Corrientes 915, I. Buenos Aires, Argentine Republic.

#### HONORABLE MENTION

To Hygienic Institute (Department of Health), La Salle, Ill.: for annual report with full table of contents.

To Division of Infant and Child Hygiene, Indiana State Board of Health: for table of contents in annual report (labeled "Index" and placed at the back instead of in the front).

#### NEW

*Pittsburgh's Health*, Department of Public Health, Pittsburgh.

#### EDUCATIONAL MATERIAL

A new list of their "best sellers" has been issued by New York State Committee on Mental Hygiene, 105 East 22d Street, New York, N. Y.

A new list of pamphlet publications has been issued by American Social Hygiene Association, 370 Seventh Avenue, New York, N. Y.

The Canadian Dental Council, 170 St. George Street, Toronto, "through the generosity of the Canadian Life Insurance Officers Association," has issued two booklets with illustrations in color: "At the Gate" and "The Joy of Living." Also two reprints: "Romance in Dentistry" and "Back of the Last Frontier." *Free.*

Committee on the Costs of Medical Care, 910 Seventeenth Street, N. W., Washington, D. C., issues numerous pamphlets. *Write.*

"Health Wanted," Tuberculosis Committee, A. I. C. P., 105 East 22d Street, New York, N. Y., 8 pages; novel cover ideas; good layout of pictures on pages; few words. *4 cents.*

Improved Sanitation in Milk Production, by Department of Agriculture. Revised. Superintendent of Documents, Washington, D. C. *5 cents.*

"The Present Status of Maternal and Infant Hygiene in the United States," by Lee K. Frankel, Metropolitan Life Insurance Company, New York, N. Y. *Free.*

"Rickets—A Tale of a Gust of Wind." League of Red Cross Societies, 2, Avenue Velasquez, Paris, France. 5 mimeographed pages. *Free.*

Sanitation of Schools—Suggestions for Teachers. Superintendent of Documents, Washington, D. C. *5 cents.*

"Swimming Pools and Other Public Bathing Places." Wallace and Tiernan Company, Box 178, Newark, N. J. Reprinted from *American Journal of Public Health*. *Free.*

#### SCHOOLS—CHILDREN

"Visual Aids for Health Lessons" is a 6-page catalogue of material offered for local school use by the Health Education Department, Public Health Cen-

ter, Oakland, Calif. Includes projectors, models, charts, posters, films, and film slides.

A series on "Lesson Planning in Health Education" began in the April issue of *Mind and Body*, New Ulm, Minn.

#### TIMELY TOPICS

The College of Agriculture, Cornell University, Ithaca, N. Y., issues a poison ivy bulletin which may aid in writing copy for use in other states. *Free.*

"A Noble and Loyal Friend" is the caption under a photograph of a dog on the cover page—inside is copy on "Rabies."—*Chicago's Health*, Department of Health. April 15, 1930.

Fundamentals of Camping, by Mary Alden Hopkins. *High School Service*. American Red Cross, Washington, D. C. May, 1930. *15 cents.* Material for house organ or news release. Includes simple statement on use of chloride of lime for purifying water.

Camp and outing standards can be furthered through publicity. A "Report Blank for Overnight Hikes, Weekend Camps and Gypsy Trips," obtained free from Girl Scouts (670 Lexington Avenue, New York, N. Y.), could be the basis of copy on the subject. The Girl Scouts also issue a "Troop Camp Report Blank" which includes questions of health significance under "Camp Site," "Housing," "Sanitary Arrangements" and "Hygiene, First Aid and Safety."

#### CONTEST—STORIES

*The Journal of the Outdoor Life*, 370 Seventh Avenue, New York, N. Y., offers prizes of \$20.00, \$10.00 and \$5.00 for the 6 best stories, and \$3.00 each for other stories it may use. "All stories must be in prose and deal in some way with tuberculosis although this need not be the outstanding theme." Closes September 1, 1930. *Write for details.*

## BOOKS AND REPORTS

### Practical Psychology and Psychiatry

—By C. B. Burr, M.D. (6th ed.)

Philadelphia: Davis, 1930. 378 pp.

Price, \$2.75.

Back in 1898 nurses in institutions for the mentally sick were not so fortunate as their present-day sisters in receiving training and enlightenment with regard to the nature and treatment of mental disease. Few if any nurses' training schools offered satisfactory courses in this subject and most of the hospitals for mental diseases were required to undertake the training in the fundamentals of psychiatry themselves if their nurses were to have any systematized knowledge about it. To be sure, there were several textbooks on mental disease nursing in those days but there was great room for improvement in them. To meet this need, Dr. C. B. Burr, then an assistant physician on the staff of the Pontiac State Hospital for Mental Diseases in Pontiac, Mich., decided to write a textbook that would facilitate the training of nurses in this particular subject.

Dr. Burr's textbook was entitled "Practical Psychology and Psychiatry" and some indication of its unusual value and popularity is found in the fact that this book has run through five editions since 1898.

Now in 1930 comes a new and revised sixth edition which is considerably enlarged over previous editions and which contains much new material. The mental nurse and attendant will extract a great deal of very solid value from this book for it is concisely written, free from frills, and gives unusually specific instructions for dealing with the 101 different problems that arise in the bedside or institutional nursing of the patients of this sort. In the section de-

voted to the definition and causes of insanity, Dr. Burr has called upon the remarkably wide and extensive experiences of his own knowledge of this work as gained by more than 45 years of experience in psychiatry. He has made free and liberal use of illustrative case material and he has also been generous in interspersing the technical material of the book with numerous of his own inimitable philosophies of life.

Faithfully read, it is believed that the nurse or attendant will find this book helpful in caring for those men and women in institutions who are undergoing "a prolonged departure from their normal standard of thinking, feeling and acting."

GEORGE K. PRATT

### Bio-Dynamics: The Battle for Youth

—By Boris Sokoloff, M.D., Sc.D.,

Ph.D. New York: Covici, Friede,

1930. 293 pp. Price, \$3.00.

The author's conception, though by no means new, is, as presented, likely to interest those who desire aid in speculating on the limitedness of the cycle of life of man. It was not written for biologists or specialists. Though not a treatise on longevity, it maintains the hypothesis of immortality and develops Metchnikoff's theory of senility and disease. That "death is better than old age" is the basic idea presented, and the aim of the treatise "is a qualitative betterment of life from the biological point of view, an amelioration and conservation of energy."

The relation of regenerative capacity and potential immortality met with where there is slight differentiation (as in the infusoria) is contrasted with the almost nonexistent regenerative capacity, the evolution of death, and the potential immortality preserved only in

the sex cells found in highly differentiated organisms (such as man). The latter possess glands which appear to be the centers of dynamic and organizing energy in the organism. The imperfect present-day knowledge of the functioning of the endocrine glands permits the author merely to indicate the trend of experimentation. That these glands are powerful agents in promoting individualization, in preserving health, etc., he demonstrates.

Senility is defined and explained as "the result of disruption and degeneration of the endocrine gland system."

Bio-dynamics is defined as "the science of the creative dynamic forces of the organism." The final analysis of life remains a question.

The book is interestingly written and fairly well documented, but we can recommend it only to those who already have knowledge of the subjects treated.

ESTHER W. STEARN

**Your Nose, Throat and Ears—**By L. W. Oaks, M.D., and H. G. Merrill, M.D. New York: Appleton, 1929. 167 pp. Price, \$1.50.

This book is written for lay people in simple and understandable language and will undoubtedly have its appeal.

The facts disclosed may enlighten the average person to such an extent that he will mend his unhygienic ways and thereby benefit.

Based upon an understanding of anatomy and physiology to be obtained from its perusal it is to be hoped that the layman will be inspired to obtain medical care early—and even more important, avoid the pitfalls of quackery.

ALEC N. THOMSON

**New Uses for Capital—**By Robert S. Field. Philadelphia: Winston, 1930. 136 pp. Price, \$1.50.

In the words of the author, this little volume is an effort to promote a wider appreciation of the financial basis of our

national progress. The essay is divided into three parts: capital and how it is invested; new objectives for investment (life and health, security and peace of mind, leisure and recreation); and methods of approach (philanthropy and taxation). Much of the basic material seems to have been assembled from reliable sources familiar to public health workers. There is relatively little new either in the approach or subject content. Most of the compilation was done while the author was engaged in graduate study. IRA V. HISCOCK

**Undulant Fever and Contagious Abortion—**By L. C. Bulmer, B.S., N.D.D. (Eng.). Birmingham, Ala.: Technical Service Bureau, 1930. 66 pp. Price, \$1.60.

This monograph summarizes much of the existing information concerning undulant fever in humans and contagious abortion in animals, and discusses the relationship of one to the other from the standpoint of transmission through meat and milk products. The material furnished affords information of interest to health officers, laboratory and agricultural workers. A useful list of chronological events—from the time Hippocrates described a protracted fever in 400 B.C., which Castellani and Chalmers believe was what is now known as undulant fever, through the reports of 1929 A.D.—is one feature. There is also a summary of comments from authoritative sources and a bibliography of 135 references. IRA V. HISCOCK

**Gesundheitswesen und Wohlfahrts-pflege im Deutschen Reiche—**Von Prof. Dr. med. Bernhard Möllers. (2d ed.) Berlin: Urban & Schwarzenberg, 1930. 634 pp. Price, 38 marks, bound.

The second edition of this much esteemed treatise on public health and welfare work in Germany will be welcomed in view of the post-war develop-

ments in this field in that country. These have been so far reaching as to require a very considerable expansion of and extensive modifications in the text of the first edition published in 1923. These affect, largely because of new legislation and regulations, the fields of the prevention of venereal diseases, child welfare, food control, care of sick and dependent classes, and social insurance. Statistics compiled last year in Germany indicate a falling off of nearly 50 per cent in the incidence of venereal diseases since the last survey in 1919.

Additions include new vital statistics resulting from stabilization following post-war aberrations, and sections on supervision of water supplies, public baths, sewage disposal, the hygiene of industry and of prisons, cancer campaigns, rheumatoid complexes, and sport and gymnastics. The discussions of tuberculosis among prisoners, and on preparations of salvarsan and on the Wassermann reaction, trypanosomiasis, apprentice and investment insurance, are given an enlarged treatment. The regulations and legislation in public health matters in Germany, among German speaking peoples, and public health movements in the League of Nations are reviewed in the third section of the book.

On account of the inclusiveness and the up-to-dateness of this edition it will be of unusual value to American workers in public health in presenting current practice in a European nation which is well advanced in this field.

C. A. KOFOID

**Public Health Aspects of Dental Decay in Children—By Raymond Franzen, Ph.D. A. C. H. A., 1930.**  
121 pp. Price, Cloth \$1.25, Paper \$1.00.

It is with great regret that so much unusual mental ability as the author possesses has been allowed to err for

lack of proper guidance. No one individual can be expected to master all branches of science, but before undertaking a subject requiring considerable highly specialized knowledge, the researcher should either familiarize himself with the basic scientific facts or obtain competent coworkers to furnish a knowledge of the field being studied. Any medically trained person should know that the correlation between a carious condition of teeth in horizontal relation to each other would be higher than between those in vertical or diagonal relation. A knowledge of elementary dental embryology teaches the reasons for this without a research.

The author after his exhaustive study "leans toward an organic or anatomic explanation of the sources of (dental) decay." Who does not? He seems to ignore the relation of environment to the development of teeth within the jaws.

Again, why should "treatment accorded to deciduous teeth have a protective influence upon permanent teeth"? Of course, corrections influence favorably the progress of decay in the teeth treated.

Dr. Franzen's conclusions on page 39 are correct. He admits the same are not new to the dental profession; then why so important to school administrators? A school board or superintendent would certainly employ a person trained in dentistry before undertaking a dental program for school children. The observations and conclusions of Chapter V on correlation of stain and tartar with dental caries are correct and in accord with accepted thought.

The application of his conclusions in Chapter VI are logical and interesting in that they confirm clinical observations with mathematical accuracy, which is of value although many practical workers in the field will question the wisdom of conducting such researches without adequate dental knowledge being made available as a guide for the

worker who is to apply the technics of modern research. We fail to see that this research has added anything to our knowledge that will help the public health official with the problems of dental disease among school children.

HARRIS R. C. WILSON

**Social Control of the Mentally Deficient**—By Stanley P. Davies, Ph.D. New York: Crowell, 1930. 408 pp. 12 ill. Price, \$3.00.

Once every so often—but unhappily not often enough—a truly monumental book flashes across the horizon of our times. This is one of those volumes, although the reviewer is convinced that this book will not flash transiently, but will remain for many years a classic in its field.

Here is a portrayal of the development of both popular and scientific attitudes with regard to feeble-mindedness from the earliest recognition of this condition down to the present day. Dr. Davies has wielded a facile pen in giving us a picture that is as fascinating as it is accurate. Do not suppose, however, that specificity has been sacrificed to the generalities that ordinarily are required by facile writing. On the contrary the book is replete with dates, statistics and other factual data that make it a valuable source-book for students of mental deficiency.

The author, in the 18 chapters that comprise this book, discusses such things as changing concepts of heredity, newer aspects of behavior, sterilization, segregation, the mentally deficient in the social order, and similar topics of interest. Each chapter is concluded with a useful bibliography, and Dr. Davies consistently gives chapter and verse to his references.

Perhaps the chief value of this book is found in the ability of the author to give us a step by step picture of the position of the mentally defective in the community. In so doing, he has given

us also a picture in longitudinal section of the growth and changes in social thinking. This has been accomplished throughout with a commendable and highly unusual objectivity.

It is difficult, as one reads this book, to draw conclusions as to what may be the author's personal views, and since he has not set out to prove anything, but only to record, this lack of emotional bias gives the book a noteworthy standing.

Health officers, nurses, physicians, social workers, students of psychology, and others, cannot afford to ignore *Social Control of the Mentally Deficient*. Dr. Frankwood E. Williams has written a foreword in which he states: "It is a book that is of more value for the student of the social aspects of mental deficiency than any other book I know."

GEORGE K. PRATT

**1930 Municipal Index**—Published by American City Magazine Corporation, 443 Fourth Avenue, New York, N. Y. 855 pp. Price, \$5.00.

The 1930 Municipal Index is the seventh edition of this yearbook prepared especially for city, town and county officials, state highway engineers, and all others interested in public improvement activities.

For the convenience of those using this handy reference book there are an alphabetical list of subjects, an index of manufactures, and consultants using the pages for advertising, and a classified list of products and services.

The subject matter is divided into 18 major sections, and sandwiched in between sections are advertisements which in a measure relate to the activities discussed in the preceding pages.

Sections in the 1930 Municipal Index which are of direct or indirect interest to public health workers deal with:

Administration, Planning, Finance, Law, Health and Welfare (Section 2)



Progress in Civic Center Development (Section 3)

Water-Supply and Purification (Section 7)

Swimming Pools and Other Public Bathing Places (Section 8)

Sewers, Sewerage and Sewage Disposal (Section 10)

Garbage, Ash and Rubbish Collection and Disposal (Section 11)

Parks and Playgrounds (Section 14)

National, State and Local Organizations (Section 17)

City Managers, Mayors, City Engineers, and Water Works Superintendents (Section 18)

Among the items touching the field of public health which are of special interest should be mentioned the suggested list of health books for city hall libraries; a bibliography on water-supply and purification; standards for public bathing beaches and wading pools; and statistics on garbage collection and disposal in 557 cities over 4,500 population.

The list of national organizations serving municipalities and local civic groups, arranged alphabetically, and providing the name of the executive officer and the address, will be welcomed by busy administrators.

A new feature of the *1930 Municipal Index* is the tabulation of city managers, mayors, city engineers, and water works superintendents in cities over 10,000 population, showing the annual salary of each. It is to be regretted that similar data for health officers in these cities are not included. Perhaps a suggestion on this might be made to the editors for the 1931 edition. A. W. FRAAS

**A Survey of the Law Concerning Dead Human Bodies—By George H. Weinmann, LL.B. Bulletin No. 73. National Research Council, Washington, D. C., 1929. 199 pp. Price, \$2.00.**

The law pursues us even after we are dead. Many important legal principles are involved in such matters—as the status of death itself, the ownership of

dead bodies, their disposition, their exhumation after burial, and post-mortem examinations. This bulletin presents a studious and comprehensive survey of existing state laws on these points and of the common law where statutes are lacking. It will be valuable to lawyers and others concerned with medico legal problems of this nature, while sanitarians will be interested in the section outlining the laws regarding the transportation of dead bodies. It is well printed and has geographical and topical indexes. The author has made a real contribution to one phase of medical and public health jurisprudence.

JAMES A. TOBEY

**Statistical Reference Data—Compiled by Godias J. Drolet and Marguerite P. Potter for Committee on Neighborhood Health Development, March, 1930. 28 pp., mimeographed.**

This Statistical Reference Handbook has been assembled to assist in visualizing health districts for the proposed health centers of the City of New York. Health districts for the five boroughs composing Greater New York are shown on health area maps while on similar maps the general death rate and infant mortality rate for 1929 are charted.

Graphic presentations of the registration of new cases of pulmonary tuberculosis, the number of cases of the principal communicable diseases reported, the elementary school registration and the distribution of hospitals and clinics over the various districts are additional features of this booklet which will be invaluable to persons interested in neighborhood health development and in the provision of adequate health services throughout the city.

The trend in population of the various districts, comparative rates of mortality, contagion and birth are presented in tabular form and serve to interpret further the health conditions and needs of each particular area. A. W. FRAAS

**Our New Religion. An Examination of Christian Science—***By H. A. L. Fisher. New York: Jonathan Cape & Harrison Smith, 1930. 201 pp. Price, \$2.50.*

This book is described as a study of Christian Science as a social phenomenon. The author maintains that it "has succeeded negatively by failing to practice what it preaches or to regard what it dislikes," and in our opinion, sustains his thesis.

The book is divided into three parts: The Prophetess, The Creed, and The Church. Although the entire book is well documented, and it is hard to see where any exception can be taken to the statements made, the first two parts especially are historical, and apparently beyond controversy. The third part is, in our opinion, equally sound, though we presume the adherents of the cult will find some objections to it.

The whole book is written as a careful study, not in the spirit of controversy, but as an inquiry and analysis. We consider it one of the best of the many which have been written about this curious faith. M. P. RAVENEL

**Yourself, Inc.: The Story of the Human Body—***By Adolph Elwyn. New York: Brentano's, 1930. 320 pp. Price, \$3.50.*

This popularized account is sufficiently simplified so that it can be read with profit by a high school freshman, or any person who lacks any knowledge whatever as to the parts and functioning of the body. Sustained interest would seem to require less effort if the author had avoided unnecessary comparisons—although a knowledge of popular taste may have decided his use of them.

The scope, style and depth of the book can be estimated by a perusal of one sentence: "Yet the living body, though a coördinated mechanism with a definite identity, is in reality a complex world of its own, a commonwealth peo-

pled by unaccountable thousands of citizens varying in size, and shape and professional activity." There are 17 chapters in the book on subjects such as the cell, the living membranes, the building trades and their strange associates, the transportation system, etc., and a short résumé of medical progress.

The 70 illustrations are excellent. The drawings and photographs, if studied by themselves, will give the reader some clear conceptions as to cell division, cell structure, various kinds of membranes, the main routes of body transportation, etc. In the first chapter of the book the author has included a few early drawings, as for example (Figure 5) muscle studies by Leonardo da Vinci, which the reader will find of interest.

ESTHER W. STEARN

**Etudes sur le Cholera—***By F. d'Herelle, R. L. Malone, and M. N. Lahiri. Alexandria, Egypt: Arturo Serafini, 1929. 191 pp.*

Therapeutic work with bacteriophage has attracted considerable attention during the past ten years and has aroused no less controversy. Consequently, when it became known that d'Herelle was undertaking experiments with cholera in India his reports were awaited with eagerness and criticised with avidity when they first appeared in preliminary form. The entire investigation has been reported in the volume under review and gives in minute detail every step of the work performed. The actual therapeutic experiments themselves form but a small portion of the work and have already been criticised because of the failure of others to obtain similar results.

One cannot read this book without being impressed with the extreme care with which much of the work was done and with the completeness of the description of the experimental method. This fact in itself makes it imperative that future investigators follow the tech-

# Pulmonary Tuberculosis in Students\*

LEE H. FERGUSON, M. D.

*Health Service, Western Reserve University, Cleveland, O.*

THERE can be no doubt that pulmonary tuberculosis in students is still a serious and unsolved problem which has not received the attention it deserves. So far as I know, no paper has ever been read before this association on the subject. In the *Proceedings of the American Student Health Association* I found that the last paper given on tuberculosis was by Dr. J. A. Myers and Dr. W. B. Shepard of the University of Minnesota on January 1, 1925.<sup>1</sup> Their paper is a record of 4 years' experience and covers 152 cases. It is possible that the reason our attention has not been attracted to this subject before is that many of the cases of pulmonary tuberculosis develop after graduation and for this reason do not fall under the observation of the Health Service. Our problem is chiefly the detection of tuberculosis in its early stages and arrested cases.

Pulmonary tuberculosis between the ages of 16 and 25 is usually of the adult type and, while it cannot be definitely proved, usually represents a new infection. The so-called infantile type, although it starts in the lung tissue, involves chiefly the tracheobronchial glands and constitutes what we now know as hilum tuberculosis. Probably most people who reach adult life, especially those who live in cities, have had an infection of this kind of greater or less extent and the X-ray may show some evidence of it in the hilum of one or both lungs. The adult type commences in the apex of the lung and is unaccompanied by tuberculous lesions of the adjacent lymph nodes.

In addition to the healed infantile lesions which most of our students will show, many of them will have pulmonary tuberculosis of the adult type. These may be apical or, as some writers are now calling them, infra-clavicular in location, and in any stage of development. The process may be latent with no signs or symptoms and only detectable with the X-ray. Again, it may be moderately advanced with definite but meager clinical signs, with no symptoms but with confirmatory X-ray evidence of lung pathology. Also, the process may

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\* Read at the Sixth Annual Meeting of the Ohio Student Health Association, Columbus, O., April 4, 1930.

be far advanced with abundant clinical signs, slight or marked symptoms, and with X-ray evidence of a serious lesion.

I have had considerable difficulty in finding any accurate figures on the incidence of tuberculosis between the ages of 16 and 25. Hetherington<sup>2</sup> stated that in Philadelphia, between the ages 12 and 18, 0.6 per cent had manifest tuberculosis, 0.8 per cent latent apical tuberculosis, and 1.2 per cent latent infiltration of childhood type. This makes a total of 2.6 per cent detectable tuberculous lesions in that age period. Similarly, from the work at the Henry Phipps Institute,<sup>3</sup> we learn that infiltrating lesions of the lungs, including both latent and manifest, are found in 2.0 per cent of boys aged 12 to 20 and in 3.4 per cent of girls.

From the evidence presented, I think we are safe in assuming that on admission to college 2 to 3 per cent of our students should show infiltrating lesions of the lungs. From the report of Dr. Myers and Dr. Shepard on conditions at the University of Minnesota and from our experience at Western Reserve University, I am led to believe that in varying degrees there is a tuberculosis problem at every institution of higher education in the country. In the school year 1927-1928 at Western Reserve we had 7 cases of tuberculosis, 5 girls and 2 boys, and 52 cases who had been in contact with tuberculosis. Two of the positive cases died during the year. In the school year of 1928-1929 we had 17 cases of tuberculosis, 12 boys and 5 girls, and 106 contact cases. There was 1 death and 2 students left college to go to sanatoriums.

Now let us enumerate without comment some of the factors in student life which may influence the development of tuberculosis. You are already familiar with these and it will not be necessary to elaborate upon them. They include change of climate, too strenuous and poorly organized social life, outside work, poor health habits, and neglect of upper respiratory infections. Under poor health habits might be enumerated lack of sleep, over-work, over-fatigue, poor food, poor living conditions, neglect of ordinary upper respiratory infections and nervous strain.

Perhaps you would be interested in a brief résumé of what I regard as a satisfactory program for the control of tuberculosis in students. The starting point is an adequate history of each individual, giving in detail the facts of his family life and his own life up to the time of his admission to college. It is very unwise to depend alone for this information on the written statement of the student which has been given on a health service blank. The examiner should in every case question the individual carefully in order that hidden and

obscure things may be brought out. Often that which in this history has been called asthma, bronchitis, pleurisy or nervous breakdown, will be found to have been tuberculosis. This history of tuberculosis in the individual or family is of great importance, for it determines how the student shall be handled while in college.

Not only is an accurate history necessary but a thorough physical examination is equally important. The initial examination should be very thorough and complete, and my own feeling is that each student should have a similar examination every year. I realize that some of you are not thoroughly convinced that this is essential but speaking from the standpoint of tuberculosis and knowing full well how insidious it may be in its onset, I feel sure that this yearly examination is an essential. In order to discover the early and latent cases of tuberculosis, the lung examination must be as complete as the one which a tuberculosis specialist would make, and should include coughing and breathing. I feel sure that without coughing many of these cases will be missed.

Austrian<sup>4</sup> states:

The most constant and significant sign of tuberculosis of the lungs is a shower of medium moist inspiratory rales heard constantly over one or the other apex, in the first or second interspace, or above the spine of the scapula with or after expiratory cough. In patients with recent infiltration, these adventitious sounds are not audible during quiet breathing but are heard only during forced respiration or are elicited by a quiet cough made at or near the end of expiration. Often the reason that they are not heard is because the observer does not instruct his patient to exhale first, then to cough gently, and then inhale while he, the listener, concentrates his attention upon the sounds heard during the cough and the beginning of the succeeding inspiration.

Admitting that we have been able to obtain from the student an accurate family history, and a complete history of his own health up to the time of his admission to college, and also that he received a thorough examination on admission and yearly thereafter, what will be the next step in our program for the control of tuberculosis? These histories should give us a complete list of all students who have been in contact with tuberculosis in their families or elsewhere. Of course there are many cases of tuberculosis in families that are not known and also many where the parents have not told the child the real nature of the disease from which they have suffered. Besides there is the large group of cases where, although tuberculosis has been known to exist, the fact has been carefully concealed from the general public. As it is well known that active tuberculosis in the family is the chief source for the spread of tuberculosis, it is extremely important that

all of these contact cases be very carefully handled. This would involve an X-ray of the lungs soon after the initial examination has been made. Even if negative, the student should have repeated physical examinations at intervals of 3 to 6 months throughout his entire college course. The X-ray should be repeated once a year even though there are no signs or symptoms of pulmonary disease. The importance of this will be brought out later in discussing the arrested cases.

In addition to the above there are many other factors which enter into the proper care of these contact cases. For instance, should they at any time during the year develop upper respiratory infections, their lungs should be repeatedly examined and, in addition, if signs are found suggesting even a bronchitis, the X-ray should be repeated. We are commencing to realize that upper respiratory infections play a very important part in producing mediastinal and pulmonary diseases and it is very probable that if the lungs are examined during even a mild so-called "cold," lung signs may be elicited which would lead to a diagnosis of pulmonary tuberculosis. So impressed am I with this one phase of upper respiratory infections that we have made it practically a routine procedure in our Health Service to make a lung examination in all cases although the symptoms may be almost entirely confined to the nasal passages or pharynx.

The habit life of all the cases that have been in contact with pulmonary tuberculosis should be carefully regulated. In other words, although the disease cannot be demonstrated clinically or otherwise, they should be regarded as cases of latent tuberculosis and treated accordingly. This should not be carried to the point of arousing their suspicion or causing any needless worry in regard to their own condition, but they should be taught to treat the matter of their habit life in a sane, sensible light. It is obvious that if a student who is a contact case is working his way through college and is subjecting himself to unusual strain he may be in grave danger of developing active tuberculosis. Last year we had two such cases. The balance by which the body is able to resist an invasion of tubercle bacilli is an extremely delicate one and may be tipped in favor of the invading organism by over-fatigue, lack of sleep, long hours of study, nervous strain, lack of exercise in the open air, poor food, and many other things which enter into the habit life of the individual. Also these students should be taught to consult the Health Service for even the slightest illness, especially upper respiratory infections, chest pains, loss of weight and loss of strength.

Last year we had under observation 106 tuberculosis contact cases.

At present we are in the midst of having lung X-rays taken of all of our contact cases. From my own experience and that of the Henry Phipps Institute,<sup>5</sup> I am firmly convinced that the X-ray is one of the most helpful means for the diagnosis of latent and arrested pulmonary tuberculosis. The X-ray may show extensive lung involvement where the lung signs and symptoms are either meager or entirely absent. Reid<sup>6</sup> reports that in the fluoroscopic examination of 4,883 applicants for employment by the Metropolitan Life Insurance Company, 59, or 1.21 per cent, passed with negative chests on physical examination, showed anatomical tuberculosis.

With these facts in mind I feel quite certain that the time is coming when we will regard a routine lung X-ray as an essential part of every complete examination. The justification for this procedure rises in the fact that many of our students have been exposed to unknown focuses of tuberculous infection in their homes, and at the time of admission, although they may give a negative history, they may very well be either latent or arrested cases of pulmonary tuberculosis. Many of these, no doubt, would be discovered by routine X-rays and the problem is simply one of reducing the expense of such a procedure to a point where it can be consistently borne by our Health Service budgets. Certainly at the present time we are entirely justified in having X-rays of all of our contact cases and of all suspicious cases with lung pathology and symptoms such as loss of weight, loss of strength and low vitality. When we have obtained from each new student a complete history, when we have given him a complete and thorough physical examination and have obtained an X-ray of his lungs, I feel sure that on admission we will find many cases of pulmonary tuberculosis which escape us at the present time.

In addition to the contact cases the inventory of our student body is sure to reveal a considerable number of arrested cases of pulmonary tuberculosis. Many of these will not know that they have had tuberculosis and recovered from it. This group, like the contact cases, demands very close attention from the Health Service. The reason for this is that almost without warning an arrested case may become active and it is surprising how quickly this change may occur. I could give you a case report where within 10 days the signs changed from a quiescent condition to marked activity. No doubt many cases which are regarded simply as hard colds or coughs which hang on, are in reality tuberculosis. As in regard to the contact cases, the arrested cases should be carefully educated to come to the Health Service for all sorts of minor ailments. Likewise their habit life should be extremely carefully adjusted and if necessary their academic schedule

should be reduced to the point where they can carry the load without danger to their health. It is particularly important also that they should treat with the utmost respect all infections of the upper respiratory tract.

The important consideration in these arrested cases, which have been picked up either through physical signs or X-ray, and also in the contact cases, should be frequent physical examinations and frequent X-rays. In general an arrested case should be examined at least every 2 months and have an X-ray every 6 months. The reason for this is that we are not at all sure that lack of physical signs is proof that the process in the lungs is not spreading. The student may seem perfectly well, may have no symptoms, no loss of weight, and no extension of clinical signs, and still the X-ray may show a definite extension of the process in the lungs. It is this which makes me recommend the repeated and frequent use of the X-ray in these cases. We have come to regard a definite X-ray spread as just as serious a matter as a clinical and symptomatic spread, and I could show you the picture of a case which showed an extensive X-ray spread and is still clinically perfectly well. Of course, as soon as any case changes from the arrested stage to the active the indications are for the student to leave school at once and receive appropriate treatment.

Next let us consider the cases of active tuberculosis which either are found by the first examination or develop later. It seems probable that even with the program which I am proposing to you, we will still continue to find such cases. Of course all such persons should be dismissed at once in order to protect themselves and the student body. I have no doubt that one active case in a fraternity, a boarding house, or even a classroom may be responsible for the development of other cases. We have a record of an open case of pulmonary tuberculosis in a fraternity which seems to have been responsible for the development of two other cases.

Of course some of these cases which apparently develop spontaneously, as I have suggested, may represent a massive infection from contact with an open case. It seems likely that many of them are simply arrested cases of pulmonary tuberculosis which have not been discovered by the physical examination. Many of these could be picked up by the routine X-raying of each student upon admission but even then it is possible that some might be missed, for the interpretation of lung X-rays, from the standpoint of the diagnosis of tuberculosis, is still extremely difficult. Admitting that some of this group are undetected arrested cases, the importance of the yearly physical examination can be readily seen. Sooner or later they may



develop signs, and it seems probable that these may precede the symptoms. As already stated, a person may have progressive pulmonary tuberculosis and still have no symptoms whatever.

Again, some of this group may be picked up through chest examinations while they have acute upper respiratory infections. It is obvious that the acute infection may light up the arrested process in the lungs and give signs which can be detected on routine examination. It would seem, therefore, that our chief means of detecting these cases are the yearly physical examination, the lung examination during acute respiratory infections and X-rays of all cases who show symptoms suggestive of pulmonary disease. It would seem that we should constantly be suspicious of deep seated, unknown tuberculosis in all of our college students, and not neglect any means at our disposal for its detection.

Lastly in my program for the control of pulmonary tuberculosis in our students I would like to propose a few things which all of you recognize as a real menace to health in general. I mean, particularly, regulation of the social life of the students; more careful adjustment of their habit life, eating, sleep, etc.; the careful supervision of all who are doing part-time work outside of their regular schedule; the re-adjustment of our programs of physical education so that the program will carry through all 4 years of undergraduate work and through professional school courses. No doubt many other things will come to you which we might do in order to protect the general health and thus prevent much tuberculosis.

Two thousand years ago a great teacher said: "Ye shall know the truth and the truth shall set you free." Nowhere is this truer than in the realm of health. We should, by patient and coördinated effort, be able to strike the shackles of an insidious disease from the lives of hundreds of those entrusted to our care. Then and only then can we count our task as well done. Who can measure the new power, the new strength, the added capacity for happiness, growth and service that may be released thereby?

#### SUMMARY

1. Pulmonary tuberculosis in students is still a serious and unsolved problem. It is usually of the adult type, insidious in onset and difficult to detect except by X-ray when there are no symptoms.
2. The incidence of pulmonary tuberculosis in students is hard to determine; it probably is between 2 and 3 per cent.
3. Special factors in student life which may favor the development of tuberculosis are: change of climate, too strenuous and poorly organized social life, outside work, poor health habits and neglect of upper respiratory infections.

4. A program in detail is presented for the solution of the problem:

Adequate history

Physical examination of all students on admission and yearly thereafter

Lung examinations to be especially thorough

X-ray of lungs of all students on admission is suggested

Special care and examinations (including X-ray) for—

a. Contact cases

b. Arrested cases

c. Cases with suspicious symptoms

d. Upper respiratory infections

Early detection of active cases and immediate dismissal to avoid spread of infection in dormitories, etc.

More careful adjustment of the entire habit life of students including social activities, outside work, recreation, etc. The recommendation is made that physical education programs should continue throughout each year of the entire undergraduate and professional school courses.

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## Polish Health Centers

HEALTH centers were first developed in Poland in 1925 through grants from the Rockefeller Foundation. On January 1, 1929, there were 140 health centers in Poland.

Each center is required to attend at least to the health of mothers and infants and anti-tuberculosis efforts; several centers have also organized anti-venereal, anti-trachoma and dentistry sections; some are engaged in the anti-alcohol campaign and in combating malaria; school hygiene is almost always among their activities.

The cost of building, management and upkeep of the health centers is met by the big urban communes, the communal administration of the several districts and partly by the sickness insurance funds; the state also makes certain grants to encourage them.

Prof. W. Chodzko, writing on "Making the Country Healthy" in the *Bulletin de l'Office Internationale d'Hygiene*, 1928, thus expresses himself:

If these Health Centers go on developing as rapidly as they are doing at present, we can expect our country soon to be covered by a network of institutions, embracing all the problems of public health and preventive medicine, and the health organizations of Poland, once this plan has been put into effect, will be definitely established on a solid, practical, and rational basis.—

*Internat. Rev. Educational Cinematography*, May, 1930, pp. 525-530.

# Physical Measurements of One Thousand Smith College Students

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IN a study of physical measurements of young women of today and of 40 or 50 years ago, it is difficult to find groups sufficiently comparable. The girl of today is an athletic person accustomed from early childhood to active participation in strenuous outdoor games. She has never known the restraint of heavy, tight clothing, and the equally curbing influence of public censure demanding that she be sedate. The increase in her physical activities throughout childhood and adolescence should show itself in the development of the grown woman.

The woman's college offers an excellent opportunity for a study of physical measurements of a large group of individuals finely selected in regard to age, intelligence and health; yet standards of physical measurements of college women are not readily available. The personnel of the hygiene department has generally too full a schedule of examinations, college dispensary and infirmary work, to attempt to correlate or interpret the findings which it records. Whether the group of college women of today and of 40 or 50 years ago is similar may also be questioned. It is now the fashion to go to college, and the girl expects to train herself to be self-supporting. In the past it was the unusual girl who went to college. She had special abilities, or keen ambitions, or for some reason wanted to gain recognition by special attainments.

The following study of physical measurements of 1,000 Smith College students was made possible through the courtesy of the college physician, Dr. Anna Richardson, and other members of the hygiene department, in allowing the use of records jointly compiled. In selecting the material the following restrictions have been made: All cases spent a limit of 4 years at college and graduated between the years 1926 and 1928, inclusive. The age range on entering college was restricted to those entering between 16 and 20 inclusive.

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In measurements of height the horizontal sliding square was used, the vertical bar being marked in inches. In measurements of height two records may be made—the first the student's height with her usual posture, and the second with her best or corrected posture. For this study the first measurement has been used. The records are taken from the student's examination on entering college in the fall and again just before graduation in June, 4 years later.

The age of the entering student is given at the nearest birthday. Since the measurements are not exactly 4 years apart it is apparent that if the age at nearest birthday of an entering student is 17, her age at nearest birthday on graduation may be 20 or 21. No correction has been made for this since it may be assumed that there can be but slight differences in the measurements in the few months.

In comparing weights of students to standard scales it is often found that the apparently healthy girl may vary from 10 to 15 pounds below the standard, or 15 to 20 pounds above. This is not always due to malnutrition or obesity but may be explained on the basis of physical builds. These have been described as slender, intermediate or stocky. Dr. Goldthwait has described the two extremes as follows:

The slender flexible individual has long been selected for the contortionist, the fancy dancer, the pole vaulter, the short distance runner. He has been the pioneer of the race, the "Uncle Sam" type. . . . The heavy or stocky individual with thick chest, heavy limbs, broad hands and feet has been used as the weight lifter, the hammer thrower, the shot putter, the wrestler, the football center, the slower moving conservative or stabilizer of the race, the "John Bull" type.<sup>1</sup>

Standards by which to measure accurately variations in build are not available and probably would be impractical in a physical hygiene department. In this study the students are included in the intermediate group unless they are definitely of the slender or stocky type.

Since the study was restricted to students entering college between the ages of 16 and 20 and only those students were included who completed the course and graduated 4 years later, the measurements included data from examinations of women between the ages of 16 and 24 inclusive. Of these students 7.3 per cent entered college at 16, 31.5 per cent at 17, 42.6 per cent at 18, 16.4 per cent at 19 and 2.2 per cent at 20.

On grouping the students according to type of build it is found that a higher percentage of students of the stocky type starts college at an earlier age, the proportion decreasing from 28.8 per cent at 16, to 17.7 per cent at 17, 16.6 per cent at 18, 12.8 per cent at 19 and 14 per cent at 20. The group of students entering at 16 contains only 19.1 per cent of the slender type, but this percentage rapidly rises to

TABLE I

MEDIAN WEIGHT OF ENTIRE GROUP OF STUDENTS AT ENTRANCE AND GRADUATION

Entrance		Graduation	
Age	Weight	Age	Weight
16	130	20	129
17	126	21	126
18	121	22	122
19	126	23	123
20	124	24	128

30.2 per cent at 17, 32.2 per cent at 18, 43.9 per cent at 19 and 45.4 per cent at 20. The percentage of students of the intermediate type remains fairly constant for all ages, varying from 40.9 to 52.1 per cent. In the entire group of students, regardless of age, there are 50 per cent of the intermediate type of build, 32.8 per cent of the slender build, and 17.2 per cent of the stocky build.

The fact that the sturdily built girl is sent to college earlier may be due to several factors. The first is that of disease experience. The person with a slender build is considered by hygienists a greater health problem throughout childhood.<sup>1</sup> Another factor may be a difference in parental attitudes. The slender girl may seem merely a child to her parents whereas the stockily built girl is expected to be self reliant. Finally, a study of menstrual periods indicates that the girl with the slender build is physically immature. This is consistent with Baldwin's findings that the tall heavily built girl tends to mature earlier.<sup>2</sup> It may be that this immaturity is not only physical, but that the girl is actually less prepared to be away from home.

Catamenia began during the 13th year in 37 per cent of the total group, and in 81 per cent had been established at either 12, 13 or 14. The variations in age at onset range from 9 (1 case) to 19 (1 case). Considering age of onset of catamenia in relation to type of build, catamenia began by the end of the 14th year in 94 per cent of the stocky type, 91 per cent of the intermediate type, and only 85 per cent of the slender type. The age of onset varied in the slender type from 10 to 17 inclusive, the median age being 13 years and 10 months. The onset range for the stocky type ran from 11 to 16 inclusive, and

TABLE II

MEDIAN WEIGHT OF STUDENTS GROUPED ACCORDING TO AGE AND TYPE OF BUILD

Type	Median Weight								
Slender	112	111	111	111	114	114	116	115	113
Intermediate	125	125	123	124	124	126	126	123	120
Stocky	145	148	144	147	143	147	135	144	144
Total	130	126	121	126	127	126	122	123	128
Age	16	17	18	19	20 <sup>1</sup>	21	22	23	24

1. Students entering college at 20.

the median age was 13 years and 3 months. In the intermediate type the median age of onset was the same as the median for the entire group, 13 years and 6 months.

The periodicity of menstruation was of the 28-day type in 67 per cent of the entire group; 2.5 per cent had a periodicity of 21 days; 4 per cent each of 30 and 31 days; 7 per cent varied between 21 and 28 days; 5 per cent had a periodicity of 35 days, and 9.4 per cent had irregular periods varying between 5 and 8 weeks. Finally, 1.2 per cent had irregular very infrequent periods, 7 of this group of 12 belonging to the slender type and the remaining 5 to the intermediate. In relation to type of build, only 10 per cent of the stocky type did not have periods once a month or more frequently, whereas 19 per cent of the slender type had periods every 5 weeks or less often.

The median weight of the entire group of 16-year old students entering college was 130 pounds, of 17-year old students 126 pounds, of 18-year 122, of 19-year 126, and of 20-year 124 pounds. The chief factor determining these weights was the proportion of slender and stocky students in the group, there being a larger proportion of stocky type students in the 16-year group. There was no consistent increase in weight in the students during college. The median weights of students entering at 16 and graduating at 20 were 130 and 129 pounds. The median weights at entrance and graduation of 18-year old students were 121 and 122 pounds, of 19-year old students, 126 and 123 pounds, and of 20-year, 124 and 128 pounds. The median weight of 17-year old students was the same, 126 pounds, on entrance and graduation. Tables I and II show the median weights of students grouped according to age and height in inches, and the median weight of each type grouped according to age.

The median weight of the slender type, grouped according to age, ranged between 111 and 116 pounds. The greatest weight in students of this type was 142 pounds, and the least weight 90 pounds. The median weight of the stocky type ranged between 135 and 148 pounds, the greatest weight being 206 pounds, one case, and the least 119 pounds. The weight of the intermediate group ranged between 120 and 126 pounds, the greatest weight was 151 pounds and the least 103 pounds. Although the examiner may have considered some of these students over or undernourished for their height and build, no note has been made of these observations.

There was no consistent increase in height in the group as a whole or in the group divided according to type. The median height determined for each age level and type of build ranged between 63.5 and 65.4 inches. Table III shows median height in inches of students

grouped according to type of build and age. The height level varied from 58 to 70.9 inches.

TABLE III

MEDIAN HEIGHT OF STUDENTS GROUPED ACCORDING TO AGE AND TYPE OF BUILD

Type	Median Height									
Slender	64.5	64.9	64.8	64.6	63.5	64.7	65.0	64.9	65.0	63.6
Intermediate	64.9	64.4	64.6	64.2	64.3	65.1	64.6	64.6	64.7	65.4
Stocky	64.3	65.1	64.8	64.8	64.3	64.7	65.5	65.5	64.8	64.7
Total	64.6	64.7	64.7	64.5	64.0	64.8	64.8	64.8	64.8	65.2
Age	16	17	18	19	20 <sup>1</sup>	20 <sup>2</sup>	21	22	23	24

1. Students entering college at 20.

2. Students graduating at 20.

To obtain comparative studies of physical measurements of school and college students, records from twenty-five to fifty years ago, Baldwin's bibliography has been used.<sup>2</sup> In each case the group compared has consisted of school or college students. The groups studied are listed as follows:

1. A report of 10,904 female school children in Boston, studied by Bowditch in 1875<sup>3</sup>
2. Measurements of 1,600 Oberlin students made by Hanna in 1893<sup>4</sup>
3. Porter's study of 16,527 female school children in St. Louis in 1894<sup>5</sup>
4. Gilbert's study of 50 women students at the University of Iowa in 1897<sup>6</sup>
5. Hastings' study of 7,069 University of Nebraska women students in 1902<sup>7</sup>
6. Baldwin's study of 88 Swarthmore students published in 1921<sup>8</sup>

With the exception of Gilbert's group and the upper age levels of Hanna's group the median height of the Smith College students at each age level is greater than those found in the comparative studies. The median weight of Smith College students of the intermediate and stocky type is greater than the weight listed in the comparative studies, with the exception of Gilbert's records. There has been no consistent increase in weight with age in the Smith College group as recorded in each of the comparative studies. Tables IV and V show the

TABLE IV

MEDIAN WEIGHT OF SMITH COLLEGE STUDENTS, GROUPED ACCORDING TO AGE, COMPARED WITH PREVIOUS SCHOOL AND COLLEGE MEASUREMENT FINDINGS

Study and Date	Weight in Relation to Age									
Smith College, 1926-1928	130	126	121	126	127	126	122	123	128	
Bowditch, 1875	113	117	116							
Hanna, 1893	84	99	101	106	113	119	124			
Porter, 1894	110	115	115	115	118					
Gilbert, 1897	111	120	124	126						
Hastings, 1902	110	110	110	112	115					
Baldwin, 1921		115	120	120	120					
Age	16	17	18	19	20	21	22	23	24	

TABLE V

MEDIAN HEIGHT OF SMITH COLLEGE STUDENTS, GROUPED ACCORDING TO AGE, COMPARED WITH PREVIOUS SCHOOL AND COLLEGE MEASUREMENT FINDINGS

Study and Date	Height in Relation to Age								
Smith College, 1926-1928	64.6	64.7	64.7	64.5	64.8	64.8	64.8	64.8	65.2
Bowditch, 1875	61	61	61						
Hanna, 1893	59	62	61	62	63	65	64	65	
Porter, 1894	62	62	62	62	62	62			
Gilbert, 1897	63	64	64	64					
Hastings, 1902	62	62	62	62	63				
Baldwin, 1921		62	62	62	63				
Age	16	17	18	19	20	21	22	23	24

median height and weight of the Smith College students, grouped according to age, compared with the previous findings at other schools and colleges. In this comparison no attempt has been made to weigh the comparative importance of such factors as differences in physical activity during childhood and adolescence, and differences in economic conditions and racial backgrounds.

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# Tuberculous Patients in New Jersey Sanatoriums

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THIS study covers all the admissions to the state and county sanatoriums during the year ending June 30, 1929, and all the discharges from and deaths in them for the same period. It was undertaken for the purpose of throwing light upon the developments in the tuberculosis sanatorium field in New Jersey; the characteristics of patients entering them; the conditions under which patients leave tuberculosis institutions; the social and economic problems created in the home by the hospitalization of the individual patient; and the extent to which communities meet their tuberculosis problems and carry out the work of tuberculosis prevention effectively.

As a background Table I is presented showing the extent to which New Jersey has provided sanatorium facilities during the last decade.

A 52 per cent increase in the number of patients in state and county tuberculosis sanatoriums per 100,000 population has occurred during the 10-year period 1919-1929. This means that, out of every 100,000 population, 48 tuberculous patients were hospitalized in 1929 as against 32 in 1919. The actual number in the institutions has risen from 996 in 1919 to 1,887 in 1929, an 85 per cent increase.

These figures do not mean that there is an actual increase in the

TABLE I  
Population All N. J. Sanatoriums as of June 30  
All Sanatoriums

Year	Number	Rate per 100,000 Population of State	State Sanatorium	County Sanatoriums
1929	1,887	48.4	356	1,531
1928	1,675	43.8	289	1,386
1927	1,599	42.6	286	1,313
1926	1,394	37.8	266	1,128
1925	1,269	35.2	255	1,014
1924	1,240	35.2	256	984
1923	1,205	35.1	236	969
1922	1,312	39.2	249	1,063
1921	1,124	34.2	235	889
1920	998	31.3	225	773
1919	996	31.8	225	771

number of tuberculous in the state, as only 5,204 new cases were reported in 1929 as against 7,460 in 1919, and the death rate for the period shows a decrease of 30.0 per cent; they indicate rather that New Jersey is taking better care of its patients and making available greater sanatorium facilities where they may be treated, and removed from the community where they are a source of infection. Clinics are seeking out active and contact cases for hospitalization and the people are recognizing the value of sanatorium treatment in an increasing measure.

#### FIRST ADMISSIONS

During the year ending June 30, 1929, 3,075 persons entered sanatoriums (1 state and 11 county); of these, 83.1 per cent were first admissions and 16.9 per cent readmissions. Of the total of 3,075 admissions 54.3 per cent were males and 45.7 per cent females. Eleven patients were admitted by transfer from one sanatorium to another in the state. Discharges numbered 2,136 and deaths 727. On June 30, 1929, there were 1,887 patients in these institutions of whom 55.9 per cent were males and 44.1 per cent females.

Particular emphasis is placed upon an analysis of the characteristics of first admissions—persons who have never before been in any institution for tuberculous diseases. First admissions are considered the best indexes of the incidence of the disease because they more nearly indicate the onset, and at what age, in which sex, in which na-

TABLE II

County from Which Patients Were Admitted	Number	Pulmonary First Admissions Percentage Distribution *		
		Minimal	Mod. Advanced	Far Advanced
Total—New Jersey—	2,200	18.7	40.7	40.6
Atlantic	89	(25.8)	(36.0)	(38.2)
Bergen	215	17.7	45.1	37.2
Burlington	60	(35.0)	(18.3)	(46.7)
Camden	207	15.5	46.4	38.1
Cumberland	41	(31.7)	(36.6)	(31.7)
Essex	484	18.6	38.6	42.8
Hudson	220	17.7	51.3	31.0
Mercer	122	17.2	42.6	40.2
Middlesex	114	8.0	43.8	48.2
Monmouth	102	17.6	35.3	47.1
Morris	58	(19.0)	(36.2)	(44.8)
Passaic	158	22.2	39.2	38.6
Somerset	40	(12.5)	(40.0)	(47.5)
Union	181	17.1	35.9	47.0
Other Counties †	109	23.9	39.4	36.7

\* Counties having less than 25 pulmonary first admissions are lumped together since the numbers are too small for calculating reliable percentages. The figures in parentheses are based on admissions between 25 and 100 and are somewhat less significant as indexes than the other figures.

† Cape May 12, Gloucester 22, Hunterdon 13, Ocean 19, Salem 15, Sussex 10, Warren 13, and out of state 5.

tionality the disease most frequently occurs; they indicate to some extent certain social and economic problems growing out of the disease, and point to the particular phases of preventive work that need to be stressed and the groups in which the work should be done.

Table II indicates the condition of 2,200 pulmonary cases entering sanatoriums for the first time.

TABLE III

## First Admissions to All Sanatoriums

Age Group	Total	Number		Percentage Distribution		
		Male	Female	Total	Male	Female
All age groups	2,556	1,370	1,186	100.0	100.0	100.0
Under 5 yrs.	23	13	10	0.8	0.9	0.8
5-9	152	82	70	6.0	6.0	5.9
10-14	189	84	105	7.4	6.1	8.8
15-19	300	126	174	11.7	9.2	14.7
20-24	396	167	229	15.5	12.2	19.3
25-29	372	158	214	14.6	11.5	18.1
30-34	260	133	127	10.1	9.7	10.7
35-39	226	142	84	8.9	10.4	7.1
40-44	209	146	63	8.2	10.7	5.3
45-49	149	118	31	5.8	8.6	2.6
50-54	108	78	30	4.2	5.7	2.5
55-59	79	58	21	3.1	4.2	1.8
60-64	40	28	12	1.6	2.0	1.0
65 and over	52	36	16	2.0	2.7	1.4
Not stated	1	1	—	0.1	0.1	0.0

Of the total of 2,200 first admissions suffering from pulmonary tuberculosis only 18.7 per cent were received in the minimal stage, 40.7 per cent were in the moderately advanced, and 40.6 per cent in the far advanced stages. The goal should be to treat all cases in the minimal stage when recovery is particularly certain, so that the moderately and far advanced stages will not be reached and will not as now be sources of infection in the community. Therefore any county showing a large proportion of minimal and a small proportion of far advanced cases entering sanatoriums usually has good clinical service, a good follow-up of contact cases, and a good educational program that has been carried on over a period of years.

## AGES OF FIRST ADMISSIONS

Forty-two per cent of first admissions were between 15 and 29 years old; 12 per cent between 15 and 19; 15.5 per cent between 20 and 24; and 14.6 per cent between 25 and 29.

Table III shows considerable age differences between the males and the females; 22 per cent of the males as against 30 per cent of the females entering sanatoriums being less than 20 years old. In the age group 20-34 about 24 per cent were males while more than

37 per cent were females. Only after 34 years is there a proportionally larger number of admissions among males than females.

The fact that 42 per cent of the patients entering New Jersey sanatoriums were between the ages of 15 and 29 calls for decided action on the part of all tuberculosis and health agencies. For those young people to be hospitalized when they are finishing their education and beginning business or professional careers means a great economic waste to the community and state as well as a serious handicap in their personal development. The fact that 15 per cent of females entered between the ages of 15 and 19 indicates the great need for health education among girls of high school age. That the high admission rate among females rises far above the males in the 15 to 29 age group and then falls off rapidly calls for action along different lines. The male admission rate remaining consistently high from 20 to 44 years of age emphasizes the relation between industry and tuberculosis and suggests that the example of organizations which are providing health examinations and education among their employees should be followed extensively.

#### COLOR OF FIRST ADMISSIONS

In New Jersey the case rate for tuberculosis is approximately four times greater among the colored than among the white; the death rate is likewise four times greater. Although the death rate for whites is decreasing rapidly, that for colored is on the upward grade. Eleven per cent of first admissions to the state and county sanatoriums are negroes although they constitute only about 4 per cent of the population. Arresting is the fact that one-tenth of all the living cases of tuberculosis on record by the State Board of Health are of negroes. That 20 per cent of the deaths from tuberculosis are among negroes reveals a still more serious condition. It is evident that many more cases proportionately occur among the negroes and that a much larger proportion prove fatal, perhaps because they contract a more virulent form of the disease or because they, who especially need hospitalization, are not finding adequate facilities for the attention they should have. For the sake of community health, therefore, the problem of tuberculosis and the negro must be met as effectively as possible and the negro must be given all the safeguards that science can command.

#### MARITAL CONDITION OF FIRST ADMISSIONS

Of 2,117 first admissions over 16 years of age 38.4 per cent were single, 53.8 per cent married and 7.7 per cent widowed or divorced. Such a large proportion of married patients is an indication of the

seriousness of the economic problem involved. During the hospitalization of these cases, most of which are in the moderately advanced or far advanced stages when longer periods of care are necessary, the family is either without a wage earner or without someone to maintain the home. The family economic and social obligations are responsible too for the fact that a large number of the patients remain too short a time in the sanatorium to receive adequate treatment.

Some of the sanatoriums with active social outlooks and some tuberculosis associations endeavor to procure financial assistance for the families of patients in order that the latter may have the freedom from worry and peace of mind that will permit their taking time for recovery. The complete relaxation necessary for cure is impossible when the patient is "harassed by worries of home, depressed by prospects for the future, fidgety for want of something to occupy the mind and hands, restless from long waiting, and impatient to have done with the tedium of institutional régime."

#### READMISSIONS

Twenty persons entered tuberculosis institutions for the second, third or fourth time for every 100 entering for the first time. Readmissions are those who have previously been under treatment in some hospital for tuberculous diseases, except those few transferred directly from another institution for tuberculous diseases in New Jersey.

Of 467 readmissions with pulmonary tuberculosis, more than half were far advanced as compared to the 40 per cent for first admissions, and 9 per cent had minimal tuberculosis as contrasted with 19 per cent of the first admissions. This indicates need for a more careful analysis of the readmitted cases, covering their condition on discharge after the first admission, the reason for leaving the sanatorium (especially against the physician's advice), the length of time between discharge and readmission, the extent to which clinical follow-up service was used and the physical, industrial and social life of the patient during the interval.

#### CONDITION ON DISCHARGE

Twenty-seven per cent of the 2,136 patients discharged from state and county sanatoriums during the year ending June 30, 1929, were quiescent, apparently arrested or arrested; 48 per cent were improved; 23 per cent unimproved; and 2 per cent non-tuberculous and under observation.

There is no better argument for the early diagnosis and treatment of pulmonary tuberculosis than the figures in Table IV, which show

TABLE IV

Condition on Admission to All Sanatoriums	Total Discharged	Arrested	App. Arrested	Percentage Discharged as Quiescent	Im-proved	Unim-proved	Non-tuberculous	Observation
All Conditions	2,136	4.3	11.3	11.6	48.4	22.5	1.7	0.2
Pulmonary								
Minimal	433	11.5	21.9	17.6	41.4	7.6	—	—
Mod. Advanced	848	4.0	13.3	14.1	46.7	21.9	—	—
Far Advanced	480	1.0	4.6	10.2	38.7	45.5	—	—
Non-Pulmonary	20	15.0	5.0	5.0	50.0	25.0	—	—
Non-Tuberculous	35	—	—	—	—	—	100.0	—
Hilum	215	0.4	5.1	1.4	79.6	13.5	—	—
Preventorium	99	—	1.0	—	92.9	6.1	—	—
Not Diagnosed	4	—	—	—	—	100.0	—	—
Observation	2	—	—	—	—	—	—	100.0

as arrested, apparently arrested, or quiescent 51 per cent of those discharged who entered with minimal tuberculosis as contrasted with 31 per cent with moderately advanced tuberculosis, and only 16 per cent with far advanced tuberculosis. Again contrast the 8 per cent of the cases minimal on admission discharged as unimproved with 46 per cent of the far advanced cases discharged as unimproved.

#### LENGTH OF STAY OF PATIENTS DISCHARGED DURING THE YEAR

It is significant to note that of the 2,136 patients leaving sanatoriums almost 40 per cent stayed less than 3 months. Of those who entered with pulmonary tuberculosis 39 per cent remained less than 3 months, 16 per cent less than 1 month, 12 per cent between 1 and 2 months, and 11 per cent between 2 and 3 months.

Patients staying less than 3 months include 46 per cent of the discharges entering with far advanced disease, 34 per cent with moderately advanced, and 39 per cent with the minimal, which latter

TABLE V

Patients Discharged Alive from All Sanatoriums

Percentage Discharged After Treatment of

Condition on Admission	Number	Less Than 1 Mo.	1 Mo. and Less Than 2	2 Mos. and Less Than 3	3 Mos. and Less Than 6	6 Mos. and Less Than 1 Yr.	1 Year and Less Than 2	2 Yrs. and Over
All Conditions	2,136	15.7	12.3	10.9	23.0	24.6	10.5	3.0
Pulmonary								
Minimal	433	10.8	14.3	13.9	26.5	24.1	8.0	2.4
Mod. Advanced	848	13.9	10.3	9.7	23.4	27.9	12.6	2.2
Far Advanced	480	21.4	14.2	10.2	18.7	20.0	10.0	5.5
Non-Pulmonary	20	15.0	20.0	20.0	5.0	15.0	10.0	15.0
Non-Tuberculous	35	65.7	5.7	14.3	2.8	5.7	5.8	—
Hilum	215	13.0	10.7	11.6	26.0	24.7	10.2	3.8
Preventorium	99	9.0	16.2	8.1	29.3	30.3	7.1	—
Not Diagnosed and Observation	6	83.3	—	—	—	—	16.7	—

group would be expected to be much larger than the other two (Table V).

That the condition of the patient on discharge is closely related to his time in the sanatorium is shown in Table VI. Those with a better condition on discharge are those with a longer period of hospitalization. Thirteen per cent of those discharged as arrested, apparently arrested, or quiescent stayed less than 3 months as contrasted with 65 per cent discharged as unimproved staying less than 3 months. Twenty-one per cent of those discharged as unimproved were actually under sanatorium care less than 1 week. The 26 per cent far advanced cases who were in a sanatorium over 3 months and less than 1 year were probably so far advanced on admission that they needed long periods of hospital care or had delayed treatment so long that improvement was difficult or impossible.

TABLE VI

Patients Discharged Alive from All Sanatoriums

Condition on Discharge	Number	Percentage Discharged After Treatment of						
		Less Than 1 Mo.	1 Mo. and Less Than 2	2 Mos. and Less Than 3	3 Mos. and Less Than 6	6 Mos. and Less Than 1 Yr.	1 Year and Less Than 2	2 Yrs. and Over
All Conditions	2,136	15.7	12.3	10.9	23.0	24.6	10.5	3.0
Arrested	93	—	4.3	8.6	29.0	30.1	21.5	6.5
Apparently Arrested	243	0.4	2.0	4.5	28.0	44.1	16.0	5.0
Quiescent	249	1.2	5.6	11.6	25.7	35.8	13.6	6.5
Improved	1,034	8.2	17.8	13.8	25.5	23.3	9.0	2.4
Unimproved	480	46.4	11.3	7.7	14.1	11.7	7.3	1.5
Not Tuberculous and Observation	37	64.9	5.4	13.5	2.7	5.4	8.1	—

## RELATION OF LENGTH OF STAY TO RECOVERY

Tuberculous patients even in the earliest stages of disease cannot expect to be cured in a few weeks. One of the major problems in the treatment of tuberculosis is to induce the patient to continue sanatorium treatment for a sufficiently long time. There is need for more educational work against impatience in recovery time and for the importance of early and continued treatment. It is not fair to the institutions to ask them to begin treatments which they are not given an opportunity to finish; neither is it fair for an uncoöperative patient to occupy a bed which would prove a real cure to a patient who is prepared to meet the instructions of the physicians in every way. Doctors, public health nurses, clinics and tuberculosis leagues should impress upon the patients before they enter the sanatorium the necessity of planning to remain until discharged by the superintendent in order that they may be restored to health that will have every chance of being permanent.

A social service worker of the sanatorium is a valuable asset in this field since, as the connecting link between the patient in the institution and the family at home, she may secure the coöperation of the patient's family in inducing him to remain, may quiet his restlessness by reports of the economic and social condition of his family, make arrangements for the financial care of the family during the absence of the bread winner, and be helpful in arranging proper home conditions to prevent tuberculosis in other members of the family, and to further the cure of the patient when discharged.

#### DEATH RATE IN SANATORIUMS

In the state and county sanatoriums 727 deaths occurred during the year ending June 30, 1929—a death rate of 15.3 per 100 under treatment. In Glen Gardner, the State Sanatorium, which takes only milder cases among whom are a number of children, has a death rate of 1.9 per 100 while in the county institutions the death rates range from 8.1 per 100 to 36.6.

The death rates of the institutions are modified by the proportion of far advanced cases admitted, the turnover of patients (that is, whether the population consists of many patients who stay short periods or fewer patients who stay for longer periods), and the policy of the institutions in sending to their homes those whose days are numbered and who beg to spend their last hours in familiar surroundings.

Eighty per cent of the 727 deaths in state and county institutions during the year occurred among patients entering with far advanced tuberculosis, 18 per cent among those entering in the moderately advanced stage, and less than 1 per cent among those entering in the minimal stage. These figures are conclusive evidence of the value of early diagnosis and treatment to prevent fatality.

Table VII shows that hospitalization of tuberculous patients is frequently sought too late, that even far advanced cases stay at home until the last minute.

TABLE VII

Condition on Admission	Total Deaths	Length of Sanatorium Stay Before Death								
		Less Than 7 Days	7-13 Days	14-29 Days	1 Mo. and Less Than 2	2 Mos. and Less Than 3	3 Mos. and Less Than 6	6 Mos. and Less Than 1 Yr.	1 Year and Less Than 2	2 Yrs. and Over
All Conditions	711	61	45	86	123	62	134	101	59	40
Pulmonary										
Minimal	6	—	—	1	2	2	—	—	1	—
Mod. Advanced	120	3	1	5	14	11	23	27	27	9
Far Advanced	577	57	43	78	106	49	109	74	31	30
Non-Pulmonary	5	1	—	—	1	—	2	—	—	1
Non-Tuberculous	3	—	1	2	—	—	—	—	—	—



Ten per cent of the deaths in far advanced cases occurred before the patients had been in the sanatorium 1 week, 31 per cent (178 deaths) before 1 month, and 49 per cent (284) before 2 months. Deaths due to far advanced tuberculosis on admission occurred in 442 cases of the 577 before 6 months had passed. Of the 120 deaths in cases admitted to county sanatoriums as moderately advanced, 7.5 per cent occurred in the first month, 11.7 per cent in the second month and 9.2 per cent in the third month.

### CONCLUSIONS

The joint efforts of many institutions and organizations in New Jersey have contributed toward a most encouraging decline in the tuberculosis death rate—a 58 per cent drop—from 179.5 per 100,000 in 1904 to 74.9 in 1929. State and county sanatoriums, state and county tuberculosis leagues, general hospitals, clinics, schools, medical and nursing services, the State Board of Health and the State Department of Institutions and Agencies working together in a common cause have contributed to the declining tuberculosis death rate. The cumulative results show that the campaign of the public health movement against tuberculosis has been effectively organized and carried out.

From the standpoint of the tuberculosis sanatorium the problems still to be solved arise from the fact that far too many patients are entering when the disease has reached a stage at which the possibilities for recovery are less certain; that the negroes are not being adequately hospitalized although they need care more than the white race; that patients are not remaining in the sanatorium a sufficient length of time to effect a cure.

As Commissioner William J. Ellis has so well said:

“Sanatoriums must seek means of keeping the patients until they can return to the community upon the physician’s advice in such a condition that they will not be a source of contagion, and social workers of the sanatoriums or the tuberculosis leagues must seek to alleviate the economic and social reasons that make the patients return to their homes too soon.

“The problem of tuberculosis will remain active until the laity have learned to seek medical advice upon recognition of the symptoms and the physicians have been awakened to the importance of detecting and diagnosing tuberculosis in its earliest stages when these early cases may be hospitalized to insure their complete recovery and to safeguard the health of the community against infection from active advanced cases.”

NOTE: Appreciation is expressed to the sanatorium superintendents and their staffs for their faithfulness in furnishing the figures upon which this study is based, to the tuberculosis workers in the communities, to the New Jersey Tuberculosis League, and the National Tuberculosis Association, for their valuable advice in the compilation and analysis of the figures used.

## EDITORIAL SECTION

*Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.*

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## MEXICAN LEADERSHIP IN PUBLIC HEALTH

NOT many months have elapsed since the Seventh Latin American Medical Congress met in Mexico City. It is, therefore, fitting that, before the end of the year, the American Public Health Association should round out its sessions at Fort Worth by a post-convention tour to this historic capital of the Aztecs, thus bringing new proof of the important rôle filled by the Republic south of the Rio Grande as a connecting link between the two great civilizations sharing the Western Continent.

The interest in Mexico in the success of the American Public Health Association is not a recent development. After the United States and Canada, Mexico was the first country to accept, as far back as 1889, the invitation to join in the work of the Association. Incidentally, this very acceptance served to emphasize the truly American character of the organization. The importance of Mexico's position in the Association from the beginning is shown by the fact that as early as 1892 the American Public Health Association had already met in Mexico City and one of her most illustrious sons, the lamented Licéaga, presided, in 1896, over the destinies of the Association whose meetings he attended as the representative of his country from 1893 to 1913.

Those fond of dwelling on the past may find much to hold their attention in Mexico. The Mayan relics have just begun to disclose the achievements of that wonderful race and its progress, even in medical subjects. Many drugs in present use have come to us from the

old inhabitants of the Anahuac plateau. Cortez had barely taken off his spurs after the *Conquista*, when he was already laying the cornerstone of a hospital, the third to be built in the Americas. This was probably about 1523, and some hundred and forty years before the first such institution for the sick was built in the English Colonies. While Mexico was not the first American country to organize a medical school, such priority belonging to Santo Domingo or Peru, medical teaching began there before 1550, and the first medical book printed in the New World (1570) was certainly that of Bravo on the dreaded "tabardillo," or typhus fever. It may be well to recall here that, in Mexico City, Anderson and Goldberger, more than three centuries afterwards, carried out their important investigations concerning the nature of this disease.

Practical sanitarians will, however, be more interested in the latest Mexican contributions to public health work. Her pioneer sanitarian, Licéaga, already, in 1893, had published the basis for a more or less uniform Pan-American sanitary policy, and Mexico was probably the first country in the world (1894) to incorporate in her maritime quarantine regulations the resolutions adopted at the international sanitary conventions. Mexico was also the cradle of the Pan-American Sanitary Bureau, and to the wisdom of her statesmen and her physicians the Pan-American Sanitary Conventions owe much of their permanence and success.

With such a history, it was, therefore, to be expected that as soon as the troublous days of the Revolution were followed by quieter times, her statesmen and sanitarians should take up anew the deferred health tasks which Licéaga was obliged to leave uncompleted.

Few countries can boast of a more comprehensive program of work than that outlined in the reports of the last two energetic heads of the Mexican National Department of Health, and in the present Director, Dr. Rafael Silva, President Ortiz Rubio has given Mexico, as the head



Rafael Silva, M.D.

of her Department of Health, a physician of international reputation, full of honors in his own country, and a man of radiant personality.

Before 1917, public health work in Mexico was entirely in the hands of local authorities, with the exception of the Federal District and the Quarantine Service, and there was lack of coördination. In 1917, the old Public Health Council, with mostly advisory functions, was transformed into a Department of Public Health, and its powers were greatly strengthened and broadened.

From 1920 to 1924 the ground was prepared for further developments by means of a campaign of public health education. This appeal to the people to coöperate in sanitary improvement was an entirely new feature in Mexico. As part of that campaign, the training of public health nurses and the establishment of a training school for physicians and nurses in public health work became an accomplished fact. At about the same time, with the aid of the Rockefeller Foundation, the campaign against yellow fever was carried to a successful termination. When President Calles took the reins of power, federal public health delegates were stationed in every state in the Republic; a compulsory vaccination law was issued and enforced; a hookworm campaign was begun on a large scale; venereal dispensaries were created; and a number of much needed public health regulations were promulgated. The old bacteriological laboratory was enlarged and developed into the present and up-to-date Institute of Hygiene.

The activities of the department embraced successively the various phases of health protection—infant mortality, communicable disease control, industrial hygiene, medical inspection of schools, railroad sanitation, and problems connected with alcoholism and the sanitation of milk and other foods. A series of censuses have been taken to determine the prevalence of such diseases as leprosy, cancer and pinto. An extensive program has been developed for the struggle against two of the worst scourges of the country: tuberculosis and malaria. Of unusual interest is the work of the new coöperative sanitary units at Veracruz and Puerto Mexico.

The hearty support rendered by the National Government to the Department of Public Health is well illustrated in the splendid new building housing the department in Mexico City, and in the funds made available for sanitary work. Under the leadership of a series of progressive men, Mexico is again assuming the rank belonging to her in the field of public health.

In conclusion, it may not be amiss to mention the fact that there are already many Pan-American congresses, Pan-American societies of medicine, of child welfare, societies for combating tuberculosis,

and others of similar import. The approaching visit to Mexico may well be used to call attention to the truly international nature of the American Public Health Association, the only organization of its kind in the Western Hemisphere.

## THE SHIP DOCTOR AND PUBLIC HEALTH

THE statement that the ship's doctor has been a term of opprobrium for decades is frequently heard. Such a pessimistic attitude is not in accord with the opinion of those who travel much and have received generous, sympathetic and good care on many ships.

It may be quite apparent that some physicians on ships have been selected for most obscure reasons; that their qualifications both personal and professional are not of the standard one would insist on ashore; that their training or actions have not been the subject of inquiry from fellow physicians, such as the chief surgeon of the passenger line, but from the captains or other officers of their ships; and finally that the dignity and responsibility of their position has been wilfully ignored by shipping companies in low salaries and lax discipline. In other words, many companies follow the law to the letter in that a physician must be present on passenger ships, no matter who or how obtained.

There is, however, another side to the question—Many ship surgeons render excellent service; they are underpaid and many times not paid for services of a definitely high character; they are the health officers of the ships, and as such, of their country, and therefore have usually no continuity of service; they are the buffers to their companies in lawsuits due to accidents and other things; their living quarters and hospital facilities are generally unsatisfactory; and they have no assistants, but work long hard hours under circumstances that would make the present-day hospital interne quiver with indignation. In other words, the honest and qualified ship surgeon is a self-sacrificing and generous man, representing in one person the specialist in medicine, surgery, obstetrics, public health—and indeed embalming—at a specified compensation comparable to most menial types of work. Moreover, the ship's doctor should be the family doctor of the highest traditions and an important part of the public health service.

The pessimism of many may be eventually changed. In fact, one American company has taken steps to place its medical service on the highest type of basis. It has appointed a chief surgeon and selected the members of the staff of one of the universities as advisers in public health and tropical medicine. This momentous advance in medicine and public health service afloat will be watched with interest, and its

intrinsic value to the shipping company, if in only prestige, very great. The recent meningitis outbreak in Filipinos on ships from the Orient fully demonstrated the need for such advisory preventive and educational health measures.

### MOUTH SPRAY AND PUERPERAL FEVER

**P**UERPERAL fever is still one of the black spots on our preventive program. In spite of the introduction of antiseptics of all sorts, the rate is still high. In England it is said not to have fallen during the past twenty years. "Despite the improvements in surgical technique and the advance of antisepsis, the maternal mortality rate has but little altered during the last decade, and sepsis is still responsible for approximately half the deaths in childbirth." America makes a bad showing in the list of nations on this score.

Obstetricians are necessarily deeply concerned, and many are avoiding the usual examinations during labor in the hope of bettering conditions. The infection occurs more frequently in hospitals than in private practice, in spite of the conveniences and care which institutional treatment provides.

A number of organisms have been incriminated—sometimes alone and sometimes in combination—but the hemolytic streptococcus still holds first place. It will be remembered that Pasteur, in 1880, was the first to demonstrate streptococci in a case of puerperal infection, showing at that time what is now known to be the fact, that puerperal fever is in reality a wound infection. It is true that the possibility of endogenous infection is involved, and there is some strong evidence for it. However, the original idea of infection from the outside has dominated medicine since the days of Semmelweis, in 1843, and we believe that the great majority of observers still hold that puerperal fever is a wound infection, the offending organism gaining access from the outside.

As a matter of course, the source of the infection has been sought long and earnestly. In some cases, its origin is obvious, but in many, not. Cultures from healthy women during pregnancy indicate that the presence of hemolytic streptococci is comparatively rare, and auto-infection is considered by many to be uncommon, some even holding that it is inappreciable.

Infection by "spraying" from the throats of contacts has been suspected in this and other countries. A recent paper<sup>2</sup> discusses the matter in a convincing fashion, giving the histories of two outbreaks in two hospitals, one of which is classed as to some extent a "special

hospital," in the sense that no emergency cases are admitted, and the other a training school for midwives. In both, every antiseptic precaution was taken, except that no masks were worn.

In the first hospital, following one infection, a bacteriological examination showed hemolytic streptococci in the noses and throats of 6 out of 50 apparently healthy persons, 3 of whom were directly concerned in the delivery. Masks were then insisted upon during delivery, and later were extended to all postpartum nursing, with apparently good results.

In the second hospital, the outbreak began with a streptococcal infection in a "district" case. One pupil appears to have been the innocent cause of the infection of 5 "district" cases and also of her fellow nurses in the hospital. While the health of the nursing staff was excellent up to a certain date, two days after the first septic case in the hospital a nurse developed an infection of a finger, and within a fortnight 5 other nurses were laid up with septic fingers or sore throats, while 2 developed symptoms suggestive of scarlet fever, though this diagnosis was not made. In 12 remaining nurses examined for hemolytic streptococci, 6 were found to be positive. Masks were then ordered for all deliveries and postpartum treatments, and appear to have been the agents which cut off the source of infection.

The author of the paper mentioned gives a fair consideration to all aspects of the case, and draws the very conservative conclusion that enough evidence was collected to justify full investigation of throat carriers.

While the evidence is not conclusive, it is believed that sufficiently strong evidence has been brought forward to make the possible importance of spraying from streptococcal throats as the source of infection in puerperal infections a matter for careful investigation. Anything which offers hope of reducing the maternal mortality deserves the most careful consideration and study.

## REFERENCES

1. *Ann. Pickett-Thompson Research Lab.*, V: 329, 1929.
2. *Brit. M. J.*, Mar. 22, 1930, p. 533.

# PRELIMINARY PROGRAM OF THE FIFTY-NINTH ANNUAL MEETING AMERICAN PUBLIC HEALTH ASSOCIATION

Fort Worth, Texas, October 27-30, 1930

**D**ELEGATES are urged to consult the Final Program, at the meeting, for information as to the exact time and place of sessions. The General Sessions and all other meetings will be held in the Hotel Texas. Morning sessions will be at 9:30; luncheon sessions at 12:30; afternoon sessions at 2:30; dinner sessions at 6:30; and evening sessions at 8:00.

## GENERAL SESSIONS

### *First Session—Monday Evening*

#### Addresses of Welcome:

THE HONORABLE WILLIAM BRYCE, Mayor, City of Fort Worth.

WALTER B. SCOTT, President, Fort Worth Chamber of Commerce.

THE HONORABLE DAN MOODY, Governor of the State of Texas.

JOHN W. BURNS, M.D., President, Texas State Medical Association.

M. E. GILMORE, M.D., President, Tarrant County Medical Society.

H. K. READ, M.D., President, Texas Association of Sanitarians.

Address of the President of the American Public Health Association. A. J. CHESLEY, M.D., State Health Officer, St. Paul, Minn.

The Health Problem in Mexico. RAFAEL SILVA, M.D., Chief of the Departamento de Salubridad Publica, Mexico City, Mex.

*Reception and Dancing.*

### *Second Session—Tuesday Evening*

#### Reports of the Four Standing Committees of the Association:

Committee on Fellowship and Membership. *Chairman*, SALLY LUCAS JEAN, New York, N. Y.

Committee on Meetings and Publications. *Chairman*, C. C. YOUNG, D.P.H., State Department of Health Laboratories, Lansing, Mich.

Committee on Administrative Practice. *Chairman*, C.-E. A. WINSLOW, DR.P.H., Yale University, New Haven, Conn.

A Study of Rural Health Work. A. W. FREEMAN, M.D., School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md., and E. L. BISHOP, M.D., State Health Commissioner, Nashville, Tenn.

Seeing Cities through the Health Conservation Contest. LOUIS I. DUBLIN, PH.D., Statistician, Metropolitan Life Insurance Company, New York, N. Y.

Committee on Research and Standards. *Chairman*, ABEL WOMAN, Chief Engineer, State Department of Health, Baltimore, Md.



Report on the White House Conference. WILLIAM F. SNOW, M.D., General Director, American Social Hygiene Association, New York, N. Y.

## BARBECUE AND RODEO

*Wednesday—4 P.M.*

*Third Session—Banquet—Thursday Evening*

No Title. ARISTIDES AGRAMONTE, M.D., Professor of Bacteriology, University of Havana, Havana, Cuba.

The Cost of Public Health as a Public Investment. LOUIS I. DUBLIN, PH.D., Statistician, Metropolitan Life Insurance Company, New York, N. Y.

*Dancing.*

## SPECIAL SESSIONS

### SYMPOSIUM ON MENINGITIS

LABORATORY, EPIDEMIOLOGY AND HEALTH OFFICERS SECTIONS

*Monday Afternoon*

Epidemiological Methods in the Control of Meningococcus Meningitis. WILLIAM H. PICKETT, M.D., State Department of Health, Lansing, Mich.

Experience of Meningitis Division of New York City Department of Health (Clinical and Bacteriological). JOSEPHINE NEAL, M.D., New York, N. Y.

Practical Problems in the Serum Therapy of Meningococcus Meningitis. A. B. WADSWORTH, M.D., State Department of Health, Albany, N. Y.

Epidemiological Study of 740 Cases and 376 Deaths from Meningococcus Meningitis in California. W. M. DICKIE, M.D., Secretary, State Board of Health, Sacramento, Calif.

An Epidemiological Study of 395 Cases of Meningococcus Meningitis. M. R. FRENCH, M.D., Health Department, Milwaukee, Wis.

Control Measures on Shipboard for Meningococcus Meningitis. J. C. GEIGER, M.D., University of California Medical School, San Francisco, Calif.

*Discussion of all papers.*

### INTER-RELATION OF THE HEALTH OFFICER AND GENERAL PRACTITIONER TO PREVENTIVE MEDICINE

*Wednesday Morning*

Addresses by:

SHIRLEY W. WYNNE, M.D., DR.P.H., Commissioner of Health, New York, N. Y.

GORDON BATES, M.D., General Secretary, Canadian Social Hygiene Council, Toronto, Ont.

W. C. C. COLE, M.D., Children's Clinic, Detroit, Mich.

RALPH REYNOLDS, M.D., Assistant in Medicine, Stanford University, San Francisco, Calif.

W. H. ROSS, M.D., President, New York State Medical Society, Brentwood, N. Y.

GEORGE C. RUHLAND, M.D., Commissioner of Health, Syracuse, N. Y.

## PSITTACOSIS

### HEALTH OFFICERS AND LABORATORY SECTIONS

#### *Thursday Morning*

History and Distribution. GEORGE W. MCCOY, M.D., Director National Institute of Health, Washington, D. C.

Etiology. CHARLES KRUMWIEDE, M.D., Department of Health, New York, N. Y.

Pathology. RALPH DOUGALL LILLIE, M.D., National Institute of Health, Washington, D. C.

Discussion. R. H. RILEY, M.D., Director, State Department of Health, Baltimore, Md.

## JOINT SESSIONS

### FOOD, DRUGS AND NUTRITION AND CHILD HYGIENE SECTIONS

#### *Monday Morning*

Local and General Aspects of the Dental and Nutritional Problems in the Large City. HARRIS R. C. WILSON, D.D.S., Director of Mouth Hygiene, Board of Education, Cleveland, O.

Precise Evaluation of Light Therapy in Experimental Rickets. JOHN W. M. BUNKER, PH.D., Professor of Biochemistry and Physiology, and ROBERT S. HARRIS, Research Associate, Massachusetts Institute of Technology, Cambridge, Mass. (*Stereopticon Illustration.*)

Fatigue. No author.

Focal Infection. WESTON A. PRICE, D.D.S., Cleveland, O.

Soft Curded Milk: Nature's Food for Infants. R. L. HILL, M.D., Human Nutritionist, Utah State Agricultural College, Logan, Utah.

Comparative Dietary Studies of Mexican, Negro and White Children of Nursery School Age. JET C. WINTERS, PH.D., Director Nutrition Research, University of Texas, Austin, Tex.

CHILD HYGIENE, PUBLIC HEALTH EDUCATION AND PUBLIC  
HEALTH NURSING SECTIONS*Tuesday Afternoon*

What Do Children Know about Health at Various Ages? DON W. GUDAKUNST, M.D., Director of School Health Service, Department of Health, Detroit, Mich.

Correlation Between the School's Medical Service and the Teaching of Health. No author.

Infantile Health Centers in the Capital of the Republic. MARIO TORROELLA, M.D., Director of Child Hygiene, Departamento de Salubridad Publica, Mexico City, Mex.

The Value of Psychiatric Service in a Visiting Nurse Program. RUTH GILBERT, R.N., Supervisor Mental Hygiene, Department of Health, Syracuse, N. Y.

Where and How Have the Best Plans Been Perfected for Developing a State-wide Program of Immunization and What Part Has the Public Health Nurse Taken? MARION SHEAHAN, R.N., Assistant Director, Division of Public Health Nursing, State Board of Health, Albany, N. Y.

PUBLIC HEALTH ENGINEERING AND FOOD, DRUGS AND  
NUTRITION SECTIONS*Thursday Morning*

Progress in the Enforcement of the New York State Milk Code. C. A. HOLMQUIST, Director, Division of Sanitation, and W. D. TIEDEMAN, Chief, Bureau of Milk Sanitation, State Department of Health, Albany, N. Y.

The Milk Control Program in Texas. C. M. ROSSER, M.D., State Board of Health, Dallas, Tex., and FRED B. GREEN, V.M.D., Chief Milk Supervisor, State Board of Health, Austin, Tex.

Effect of Heat on Food Value of Milk. M. J. PRUCHA, and J. M. BRANNON, PH.D., University of Illinois, Urbana, Ill.

Present Status of Acidophilus Milk. WILLIAM D. FROST, DR.P.H., University of Wisconsin, Madison, Wis.; T. H. BUTTERWORTH and STEWART M. FARR, Laboratories of Brook Hill Farms, Genesee, Wis.

Relative Corrosiveness of Equipment by Dairy Products. J. H. SHRADER, PH.D., Director, Research Laboratory, National Dairy Products Corporation, Baltimore, Md.

Preliminary Report of Studies on Transformation of the Intestinal Flora Through the Feeding of Unfermented Acidophilus Milk. R. P. MYERS, PH.D., M. E. PARKER and LILLIAN W. CONN, Research Laboratory, National Dairy Products Corporation, Baltimore, Md.

PUBLIC HEALTH ENGINEERING AND INDUSTRIAL HYGIENE  
SECTIONS

*Thursday Afternoon*

JOHN F. SKINNER, *Chairman*, Public Health Engineering Section, *Presiding*.

SYMPOSIUM ON ATMOSPHERIC POLLUTION

Introduction. ANTHONY J. LANZA, M.D., *Chairman*, Industrial Hygiene Section, Assistant Medical Director, The Metropolitan Life Insurance Company, New York, N. Y.

Engineering Phases of Industrial Hygiene. L. R. THOMPSON, M.D., Surgeon in charge, Office of Industrial Hygiene and Sanitation, U. S. Public Health Service, Washington, D. C.

The Medical Aspects of Atmospheric Pollution. T. C. TERRELL, M.D., Terrell Laboratories, Fort Worth, Tex.

The Amelioration of Atmospheric Pollution. HOWARD W. GREEN, Sanitary Engineer, Cleveland Health Council, Cleveland, O.

The Public Health Aspects of Atmospheric Pollution. C. A. SAPPINGTON, M.D., Director, Division of Industrial Health, National Safety Council, Chicago, Ill.

*Discussion of all papers.*

SECTION SESSIONS

LABORATORY

*First Session—Wednesday Morning*

Report of the Committee on Standard Methods. *Chairman*, E. O. JORDAN, PH.D., University of Chicago, Chicago, Ill.

Laboratory Methods and Their Utilization in Milk Control. ROBERT S. BREED, PH.D., State Agricultural Experiment Station, Geneva, N. Y.

The Gordon Precipitation Test for Smallpox. L. C. HAVENS, M.D., Director of Laboratories, State Board of Health, Montgomery, Ala.

The Results of Serological and Cultural Examination of Three Thousand Specimens of Blood. THOMAS F. SELLERS, Director, State Board of Health Laboratories, Atlanta, Ga.

Experimental Typhoid Carriers. A Study of Factors Affecting the Periodic Shedding of Organisms. LLOYD ARNOLD, M.D., Professor of Bacteriology, University of Illinois, Chicago, Ill., and THOMAS G. HULL, PH.D., Director, State Board of Health Laboratory, Springfield, Ill.

Standardization of the Wassermann Reaction. PEDRO PEREZ GROVAS, M.D., Departamento de Salubridad Publica, Mexico City, Mex.

Immunization of Dogs Against Rabies by the One Injection Method. H. W. SCHOENING, D.V.M., Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.

**The Lethal Effects of Methyl Chloride on Laboratory Animals.** JOHN L. WHITE, M.D., FRED O. TONNEY, M.D., and PAUL P. SOMERS, Bureau of Laboratories and Research, Department of Health, Chicago, Ill.

*Second Session—Thursday Afternoon*

**Report of the Committee on Abstracts in the Journal.** *Chairman,* C. C. YOUNG, D.P.H., State Department of Health Laboratories, Lansing, Mich.

SYMPOSIUM ON UNDULANT FEVER

**Identification of Strains of Brucella Group of Organisms. I.** FOREST HUDDLESON, D.V.M., Michigan State College, East Lansing, Mich.

**The Effects of Pasteurization on B. Abortus in Milk.** CHARLES M. CARPENTER, PH.D., D.V.M., Albany Medical College, Albany, N. Y.

**A Study of the Epidemiology of Undulant Fever.** H. E. HASSELLTINE, M.D., U. S. Public Health Service, Washington, D. C.

**Agglutins for B. Abortus in the Blood and Milk of Cows and the Use of the Agglutination Reaction in the Control of Certified Milk.** JOHN F. NORTON, PH.D., and L. R. PLESS, Department of Health, Detroit, Mich.

**Public Health Control of Infectious Abortion in Certified Milk.** K. F. MEYER, M.D., George Williams Hooper Foundation for Medical Research, University of California, San Francisco, Calif.

**B. Abortus in Certified Milk.** D. E. HASLEY, M.S., Detroit School of Medicine, Detroit, Mich.

HEALTH OFFICERS

*First Session—Tuesday Morning*

**Public Health and the City Manager.** O. E. CARR, City Manager, Fort Worth, Tex.

**Mexican Immigrants.** E. O. CHIMENE, M.D., City Health Department, Austin, Tex.

**Texas-Mexico Border Health Problems.** J. C. ANDERSON, M.D., State Health Officer, Austin, Tex.

**Decrease of Tuberculosis in Mexico.** SALVADOR BERMUDEZ, M.D., Departamento de Salubridad Publica, Mexico City, Mex.

*Section Business.*

*Dinner Session—Tuesday Evening*

**The Health Officer of the Past.** JAMES A. HAYNE, M.D., State Commissioner of Health, Columbia, S. C.

**The Health Officer of the Present.** No author.

**The Health Officer of the Future.** ARTHUR T. MCCORMACK, M.D., State Department of Health, Louisville, Ky.

## VITAL STATISTICS

*First Session—Monday Morning**Announcements.*

**Difficulties in Rural Registration Overcome Without Money.**  
 BUTLER TOOMBS, Director, Bureau of Vital Statistics, State Board of Health, Atlanta, Ga.

**Report of the Committee to Aid Completion of the Registration Area.** *Chairman*, LOUIS I. DUBLIN, PH.D., Statistician, Metropolitan Life Insurance Company, New York, N. Y.

**Report of the Committee on Registration Affairs.** T. F. MURPHY, M.D., *Acting Chairman*, Chief Statistician for Vital Statistics, Bureau of the Census, Washington, D. C.

**Physical Findings in New York City Continuation School Boys—An Element in the Vital Statistics of Adolescents.** JEROME MEYERS, M.D., Department of Health, New York, N. Y.

**Discussion.** SELWYN D. COLLINS, PH.D., Associate Statistician, in Charge of the Office of Statistical Investigations, U. S. Public Health Service, Washington, D. C.

**No Title.** J. V. DEPORTE, PH.D., Director, Division of Vital Statistics, State Department of Health, Albany, N. Y.

**Discussion.** FREDERICK L. HOFFMAN, LL.D., Consulting Statistician, Prudential Insurance Company of America, Newark, N. J.

*Second Session—Tuesday Morning**Section Business.*

**No Title.** MANUEL MARTINEZ BAEZ, M.D., In charge of Propaganda and Education, Departamento de Salubridad Publica, Mexico City, Mex.

**Report of the Committee on Accuracy of Certified Causes of Death and Its Relation to Mortality Statistics and the International List.** *Chairman*, HAVEN EMERSON, M.D., Department of Public Health Administration, Columbia University, New York, N. Y.

**Report of the Committee to Coöperate with the National Safety Council in Preparing Forms for Additional Information Regarding Accidents.** *Chairman*, W. THURBER FALES, SC.D., State Registrar, State Board of Health, Montgomery, Ala.

**The Accident Problem in Kansas.** EARLE G. BROWN, M.D., Executive Health Officer, State Board of Health, Topeka, Kans.

**Woman's Part in the Safety Campaign.** GEORGE H. VAN BUREN, Supervisor, Statistical Bureau, Metropolitan Life Insurance Company, New York, N. Y.

*Third Session—Thursday Morning*

Completion of the Registration Area. LOUIS I. DUBLIN, PH.D., Statistician, Metropolitan Life Insurance Company, New York, N. Y.

Neonatal Mortality as Affected by Mother's Age and Obstetrical Care. ELBRIDGE SIBLEY, Statistician, State Department of Public Health, Nashville, Tenn.

*Discussion.* BLANCHE M. HAINES, M.D., Director, Maternity and Infancy Division, U. S. Children's Bureau, Washington, D. C.

Mortality from Puerperal Septicemia in the United States During Recent Years. GAUIS E. HARMON, M.D., Department of Hygiene and Bacteriology, School of Medicine, Western Reserve University, Cleveland, O.

Report of the Committee on Proper Allocation of Records. *Chairman*, J. V. DEPORTE, PH.D., Director, Division of Vital Statistics, State Department of Health, Albany, N. Y.

Report of the Committee on Joint Causes of Death. *Acting Chairman*, T. F. MURPHY, M.D., Chief Statistician for Vital Statistics, Bureau of the Census, Washington, D. C.

*Fourth Session—Thursday Afternoon*

Hospital Statistics. E. H. LEWINSKI CORWIN, PH.D., Academy of Medicine, New York, N. Y.

Excess Mortality from Non-respiratory Causes During Influenza Epidemics. SELWYN D. COLLINS, PH.D., Associate Statistician, in Charge of the Office of Statistical Investigations, U. S. Public Health Service, Washington, D. C.

An Old Life Table or Rate Survivorship Table for New York City for the Years 1801-05. CHARLES BOLDUAN, M.D., Director of Health Education, Department of Health, New York, N. Y.

Report of the Committee on Public Health Climatology. *Chairman*, E. W. KOPF, Metropolitan Life Insurance Company, New York, N. Y.

No Title. LOWELL J. REED, PH.D., Department of Biometry and Vital Statistics, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.

No Title. SHIRLEY W. WYNNE, M.D., DR.P.H., Commissioner of Health, New York, N. Y.

## PUBLIC HEALTH ENGINEERING

*First Session—Tuesday Morning*

Waterborne Typhoid Still a Menace. ABEL WOLMAN, Chief Engineer, State Department of Health, Baltimore, Md., and ARTHUR E. GORMAN, Wallace & Tiernan Co., Inc., Newark, N. J.

The Effect of Taste Elimination Treatments on the Bacterial Quality of the Water (Report of the Committee on Water Supply). *Chairman*, JOHN R. BAYLIS, Filtration Chemist, Department of Public Works, Chicago, Ill.

SYMPOSIUM ON PUBLIC HEALTH ENGINEERING PROBLEMS IN THE  
SOUTHWEST

Sanitary Features of Irrigation Projects. JANE H. RIDER, Director  
State Laboratory, Tucson, Ariz.

Plan of Organization of a Federal Department of Drainage  
Works. JOAQUIN M. SEGURA, Sanitary Engineer, Departamento de  
Salubridad Publica, Mexico City, Mex.

Control of Cross-Connections in Texas Cities. W. N. DASHIELL,  
City Sanitary Engineer, Fort Worth, EDGAR WHEDBEE, City Water  
Department, Dallas, and J. A. SAULS, City Water Department, Hous-  
ton, Tex.

Sanitary Control of Underground Water Supplies in Texas.  
CHESTER COHEN, State Department of Health, Austin, Tex.

Emergency Sanitary Measures Following a Flood Disaster.  
PAUL S. FOX, Chief, Division of Sanitary Engineering and Sanitation,  
Bureau of Public Health, Santa Fe, N. M.

Progress in Disaster Relief Preparedness Programs (Report of the  
Committee on Disaster Relief). *Chairman*, E. L. FILBY, Chief Engi-  
neer, State Board of Health, Jacksonville, Fla.

*Second Session—Tuesday Afternoon*

## SYMPOSIUM ON MALARIA CONTROL

The Increase in the Malaria Incidence—a Challenge. JOHN A.  
FERRELL, M.D., Associate Director, International Health Division,  
Rockefeller Foundation, New York, N. Y.

Cost of Malaria Control. J. A. LEPRINCE, Senior Sanitary Engineer,  
U. S. Public Health Service, Memphis, Tenn.

Promoting Malaria Control Programs (Report of the Committee on  
Insects and Rodents). *Secretary*, G. H. HAZELHURST, Chief Sanitary  
Engineer, State Board of Health, Montgomery, Ala.

Screen and Mosquito Proofing as Elements in a Malaria Control  
Program. H. R. FULLERTON, C.E., Department of Public Health,  
Nashville, Tenn.

The Sanitary Significance of River Flood Control (Report of the  
Committee on Waterways Pollution). *Chairman*, ERNEST R. BOYCE,  
Chief Engineer, State Board of Health, Lawrence, Kans.

The Promotion of Environmental Sanitation (Report of the Com-  
mittee on Environmental Sanitation). *Chairman*, V. M. EHLERS, Chief  
Engineer, State Department of Health, Austin, Tex.

Eliminating Health Hazards in Plumbing (Report of the Joint Com-  
mittee on Plumbing). *Chairman*, JOEL I. CONNOLLY, Chief, Bureau of  
Sanitary Engineering, Department of Health, Chicago, Ill.

Recent Developments in Sewage Disposal (Report of the Com-  
mittee on Sewage Disposal). *Chairman*, LANGDON PEARSE, Sanitary  
Engineer, The Sanitary District of Chicago, Chicago, Ill.

Significant Items on Pasteurization of Milk (Report of the Com-  
mittee on Milk Supply). *Chairman*, H. A. WHITTAKER, Director,  
Division of Sanitation, State Department of Health, Minneapolis, Minn.



Shell Fish Sanitation Studies (Report of the Committee on Shell Fish Supply). *Chairman*, H. D. PEASE, M.D., Pease Laboratories, New York, N. Y.

Detailed Committee Reports will be available in mimeographed form to those present, but practically all will be delivered by the Chairmen in condensed form to provide ample time for discussion.

*Sunday, October 26*

All day inspection trip for Conference of State Sanitary Engineers and *all visiting engineers*, leaving Fort Worth by automobile 9.00 A.M., arriving Dallas 10.00 A.M. Inspection of Dallas's new water purification plant and old sewage purification plant, ending with complimentary visit to the State Fair of Texas where the group will have access to a variety of entertainment.

*Tuesday, October 28—6.30 P.M.*

Public Health Engineering Section and Conference of State Sanitary Engineers. Annual Engineers Stag Dinner Party at Hotel Texas.

*Wednesday, October 29*

Joint Inspection Trips—Public Health Engineering Section and Conference of State Sanitary Engineers:

9.30 A.M.—Fort Worth Water Purification and Sewage Treatment Plants.

Swift and Armour Packing Plants.

Complimentary Luncheon.

2.00 P.M.—Cleburne Sewage Works.

INDUSTRIAL HYGIENE

*Luncheon Session—Monday*

*Presiding*: ANTHONY J. LANZA, M.D., Assistant Medical Director, Metropolitan Life Insurance Company, New York, N. Y.

*First Session—Monday Afternoon*

Chairman's Address. ANTHONY J. LANZA, M.D., Assistant Medical Director, Metropolitan Life Insurance Company, New York, N. Y.

Human Relationships on Railroads. J. N. REDFERN, Manager, Relief, Medical, Employment and Pension Department, Chicago, Burlington & Quincy Railroad Company, Chicago, Ill.

*Discussion*

Abnormal Mental States Among Industrial Workers. EMERSON NORTH, M.D., Director, The Mental Hygiene Clinic, Cincinnati, O.

*Discussion.*

Industrial Medical Experiences in South Africa. J. G. CUNNINGHAM, M.D., Provincial Board of Health, Toronto, Ont.

*Discussion.*

*Section Business and Election of Officers.*

*Second Session—Tuesday Afternoon*

**Lead Poisoning in the United States During 1929-1930** (Report of the Committee on the Status of Lead Poisoning). *Chairman*, EMERY R. HAYHURST, M.D., Professor of Hygiene, Ohio State University, Columbus, O.

*Discussion.*

**Nomenclature in Occupational Diseases** (Report of the Committee on Standard Practices in the Problem of Compensation of Occupational Diseases). *Chairman*, HENRY H. KESSLER, M.D., Medical Director, Occupational Disease Clinic, State Department of Labor, Newark, N. J.

*Discussion.*

**Developments in the Field of Industrial Fatigue** (Report of the Committee on Industrial Fatigue). ANTHONY J. LANZA, M.D., Assistant Medical Director, Metropolitan Life Insurance Company, New York, N. Y.

*Discussion.*

**The Newer Volatile Solvents** (Report of the Committee on Volatile Solvents). *Chairman*, ELIZABETH B. BRICKER, M.D., Chief of Hygiene and Sanitation, Department of Labor and Industry, Harrisburg, Pa.

*Discussion.*

**Toxicity of Benzol Hemologues.** HENRY FIELD SMYTH, M.D., University of Pennsylvania, Philadelphia, Pa.

*Discussion.**Section Business.**Third Session—Thursday Morning*

**Industrial Medicine in Mexico.** JOAQUIN M. SEGURA, M.D., Sanitary Engineer, Departamento de Salubridad Publica, Mexico City, Mex.

*Discussion.*

**Fungus Infection of the Skin of Industrial Workers.** ROBERT T. LEGGE, Ph.G., M.D., Professor of Hygiene, University of California, Berkeley, Calif.

*Discussion.*

**Cardio Vascular Lesions Among One Thousand Industrial Machine Operators.** A Report of One Thousand Physical Examinations of Machine Operators. WILLIAM A. MUHLBERG, M.D., Medical Director, The Union Central Life Insurance Company, FLOYD P. ALLEN, M.D., Secretary, The Heart Council of Greater Cincinnati, and BLEECKER MARQUETTE, Secretary, The Public Health Federation, Cincinnati, O.

*Discussion.*

**Occupational Nystagmus.** CAREY P. McCORD, M.D., Medical Director, The Industrial Health Conservancy Laboratories, Cincinnati, O.

*Discussion.*

## FOOD, DRUGS AND NUTRITION

*First Session—Tuesday Afternoon*

Report of the Committee on Fish and Shell Fish. *Acting Chairman*, A. C. HUNTER, PH.D., In Charge, Bacteriological Unit Food Control Laboratory, Food, Drug and Insecticide Division, U. S. Department of Agriculture, Washington, D. C.

Some Observations on Enforcement of Food and Drug Laws in Texas, Including Ginger Poisoning. E. J. LEMAY, State Department of Health, Austin, Tex.

Newer Knowledge on Botulism and Mussel Poisoning. K. F. MEYER, M.D., George Williams Hooper Foundation for Medical Research, University of California, San Francisco, Calif.

## SYMPOSIUM ON OCCURRENCE OF MINUTE AMOUNTS OF METAL IN FOODS

The Use of Metallized Foods. PROF. J. L. MCGHEE, Emory University, Atlanta, Ga.

Iodine in Nutrition WILLIAM WESTON, M.D., South Carolina Food Research Committee, Columbia, S. C.

Effect of Metals Derived from Cooking Utensils on the Health of the Consumer. WALTER H. EDDY, PH.D., Teachers College, Columbia University, New York, N. Y.

*Discussion.* F. C. BLANCK, PH.D., Food Research Division, U. S. Bureau of Chemistry and Soils, Washington, D. C.

Report of the Committee on Meat and Meat Products. *Acting Chairman*, PAUL E. HOWE, PH.D., Senior Biological Chemist in Charge, Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.

*Second Session—Wednesday Morning*

Report of the Committee on Cereals and Their Products. *Chairman*, F. C. BLANCK, PH.D., Food Research Division, U. S. Bureau of Chemistry and Soils, Washington, D. C.

Report of the Committee on Nutritional Problems. *Chairman*, PROF. HENRY C. SHERMAN, Department of Chemistry, Columbia University, New York, N. Y.

A Study of the Diets of Federal Prisoners. PAUL E. HOWE, PH.D., Senior Biological Chemist in Charge, Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.

The Nutritive Values of Processed Milks. JAMES A. TOBEY, PH.D., Director Health Service, The Borden Company, New York, N. Y.

Some Observations on Musty Eggs. PROF. MAX LEVINE and D. Q. ANDERSON, Iowa State College, Ames, Iowa.

Report of the Committee on Fruits and Vegetables. *Acting Chairman*, WALTER H. EDDY, PH.D., Teachers College, Columbia University, New York, N. Y.

Report of the Committee on Milk and Dairy Products. *Chairman*, WILLIAM B. PALMER, Executive Officer, Milk Inspection Association of the Oranges, Orange, N. J.

*Luncheon Session—Wednesday*

## CHILD HYGIENE

*First Session—Tuesday Morning*

PRACTICAL APPLICATION OF THE COMMUNITY CHILD HYGIENE PROGRAM  
The Infant Before, During and After Birth (From early pregnancy through first year of life). RICHARD A. BOLT, M.D., Director, Cleveland Child Health Association, Cleveland, O.

The Community Health Program as It Applies to the Child from One to Six Years of Age. H. N. BARNETT, M.D., Chief, Division of Child Hygiene, State Department of Health, Austin, Tex.

The Community Health Program As It Applies to the Child from Six Years to Adolescence. WALTER H. BROWN, M.D., Professor of Hygiene, Department of Physical Education and Hygiene, Stanford University, Palo Alto, Calif.

The Adolescent Age. No author.

## PUBLIC HEALTH EDUCATION

*First Session—Monday Morning*

What Mr. Average Citizen Knows and Does About Health. HOWARD W. GREEN, Sanitary Engineer, Cleveland Health Council, Cleveland, O.

What He Should Know and Do. C.-E. A. WINSLOW, DR.P.H., Yale University, New Haven, Conn.

The Work of the Health Department of Mexico in Relation to Health Education. MANUEL MARTINEZ BAEZ, M.D., In charge of Propaganda and Education, Departamento de Salubridad Publica, Mexico City, Mex.

*Dinner Session—Monday Evening*

Closed Session—For Members and Fellows of Section only  
*Section Business.*

*Luncheon Session—Tuesday*

What an Extension Division of a University Can Do Along the Lines of Public Health Education. BERTHA ASHBY, University of Oklahoma, Norman, Okla.

*Discussion.* JEAN M. PINCKNEY, University of Texas, Austin, Tex.

*Second Session—Thursday Morning*

Hazards of Commercial Health Advertisements. BLEECKER MARQUETTE, Executive Secretary, Public Health Federation, Cincinnati, O.

What Technic of Commercial Advertisers May Be Used Effectively by the Health Worker? W. W. BAUER, M.D., Health Officer, Racine, Wis.

*Discussion.* HAVEN EMERSON, M.D., Department of Public Health Administration, Columbia University, New York, N. Y., and J. C. FUNK, Director of Health Education, State Department of Health, Harrisburg, Pa.

## PUBLIC HEALTH NURSING

### *First Session—Monday Afternoon*

The Relation of Official and Non-Official Groups Administering Public Health Nursing Service in the Following Respects:

- a. Joint Staff Education Program.
- b. Sharing of Specialized Supervisors such as Nutrition and Mental Hygiene.
- c. Division of Responsibility to Avoid Duplication in Program of Work in Families.

ELIZABETH W. HOLT, R.N., Director of Nursing, Visiting Nurse Association, Dayton, O.

### *Discussion.*

How Can We Teach Public Health Agents, Particularly the Rural Nurse, to Present Her Public Health Needs and Results in an Interesting Manner to Appropriating Bodies with the Object of Obtaining Increased Support? RUTH WOOD, R.N., Director, Maternity Center Association, Brooklyn, N. Y.

How To Secure and Use Advisory Committees for Official and Non-Official Agencies. NETTA FORD, R.N., Visiting Nurse Association, York, Pa.

Nursing Service and Health Education Must Dovetail to Have an Effective Health Program. The Nurse's Part in Arousing Interest and Suggesting Methods for Results. KATHARINE HAGQUIST, R.N., State Department of Health, Austin, Tex.

### *Second Session—Tuesday Morning*

The Prevention of Cancer as a State-Wide Program and the Nurse's Responsibility in This Program. JOSEPH COLT BLOODGOOD, M.D., Chairman, Maryland Cancer Committee, Baltimore, Md.

### *Discussion.*

Problems Equally Trying to Health Officer and Nurse in the Administration of Small Town or Rural Health Work. Plans that Have Been Effective. The Kind of Administration that Develops the Nurses and Makes it Possible for Them to get Effective Results. JESSIE L. MARRINER, R.N., Director, Bureau of Health Hygiene, and Public Health Nursing, State Board of Health, Montgomery, Ala.

How the Nursing Staff of a Well Organized County Health Department is Directed and Obtains Effective Results through Supervision. No Author.

Discussion on Administrative Practice in States, Counties and Cities. What are the Nurse's Responsibilities and How Should She Correlate Her Activities with Other Health Agencies? MYRA CLOUDMAN, R.N., American Red Cross, St. Louis, Mo.

The Work of the Visiting Nurse in Mexico. MARIO TORROELLA, M.D., Director of Child Hygiene, Departamento de Salubridad Publica, Mexico City, Mex.

## EPIDEMIOLOGY

### *First Session—Monday Morning*

#### SYMPOSIUM ON TYPHOID FEVER

Water-Borne Typhoid at Seneca Falls. F. W. SEARS, M.D., Syracuse. N. Y.

Epidemiological Features of Typhoid Fever in Richmond, Virginia. A. W. FREEMAN, M.D., School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.

Olean City Epidemic of Typhoid Fever in 1928. A. S. DEAN, M.D., State District Health Officer, Jamestown, N. Y.

Typhoid Fever in Knoxville, Tenn. (second paper) with special reference to the significance of findings in a detailed sanitary survey of the city. WILLIAM H. ENNEIS, M.D., Knoxville, Tenn.

*Discussion of papers on Typhoid Fever.*

### *Second Session—Wednesday Morning*

Incidence of Partial Paralysis. H. C. STEWART, M.D., and E. L. BISHOP, M.D., State Department of Health, Nashville, Tenn.

Incidence of So-called "Jake" Poisoning in Oklahoma City and Vicinity. DAVID T. BOWDEN, M.D., Director of Laboratories, State Department of Public Health, Oklahoma City, Okla.

*Discussion.*

Administrative Aspects of Epidemiology. GEORGE H. RAMSEY, M.D., Johns Hopkins University, Baltimore, Md.

*Discussion.*

Observations on the Result of Immunization Against Diphtheria in Children upon Case Incidence and Mortality from this Disease. C. H. KINNAMAN, M.D., Topeka, Kans.

*Discussion.*

## MEETINGS OF OTHER ORGANIZATIONS DURING THE CONVENTION

American Association of School Physicians. Program to be Announced.

International Society of Medical Health Officers joint with the American Association of School Physicians. Program to be announced.

Association of Women in Public Health. Program to be announced.

Conference of State Sanitary Engineers (See Public Health Engineering Section Program).

Texas Association of Sanitarians. Program to be Announced.

1930 European Delegation. Dinner—Monday Evening.

Delta Omega. Dinner—Wednesday Evening.

## PRELIMINARY PROGRAM

### SCIENTIFIC SESSIONS IN MEXICO CITY

#### *Monday Morning, November 3*

Address of Welcome. RAFAEL SILVA, M.D., Chief of the Departamento de Salubridad Publica, Mexico City, Mex.

Reply to Address of Welcome. A. J. CHESLEY, M.D., President, American Public Health Association; HUGH S. CUMMING, M.D., Surgeon General, U. S. Public Health Service, Washington, D. C.; and J. C. ANDERSON, M.D., State Health Officer, Austin, Tex.

History of Health in Mexico. ULISES VALDES, M.D., Secretary General, Departamento de Salubridad Publica, Mexico City, Mex.

Local Public Health Work. MIGUEL BUSTAMANTE, M.D., Director Health Unit, Vera Cruz, Mex.

Display of Film Showing Public Health Work in Mexico.

#### *Tuesday Morning, November 4*

Address. W. S. RANKIN, M.D., Chairman, Executive Board, American Public Health Association, Duke Endowment, Charlotte, N. C.

Address. B. J. LLOYD, M.D., Pan American Sanitary Bureau, Washington, D. C.

Safeguarding a City Milk Supply. H. V. CARDONA, D.V.M., Supervisor of Milk Sanitation, Department of Public Health and Welfare, Fort Worth, Tex.

*For information regarding railroad fares to Fort Worth, hotel rates in Fort Worth, and full details of the Mexico City post convention tour, consult June and July issues of the American Journal of Public Health.*

# ASSOCIATION NEWS

## FIFTY-NINTH ANNUAL MEETING FORT WORTH, TEXAS *October 27-30, 1930*

### SOME MEMBERS OF THE LOCAL COMMITTEE



A. H. FLICKWIR, M.D.  
*Director Public Health and  
Welfare, Fort Worth, Tex.*



J. C. ANDERSON, M.D.  
*State Health Officer,  
Austin, Tex.*



MRS. HENRY B. TRIGG  
*Chairman, Women's Enter-  
tainment Committee,  
Fort Worth, Tex.*

### WELCOME TO TEXAS

MRS. O. E. CARR

*Member of Women's Entertainment Committee, Fort Worth, Texas*

ROTARIANS seem to have recognized earliest the benefits of close association and travel. Every separate organization of that leadership has become a "know your own country" enthusiast. The American Public Health Association has set its face toward Texas for its late October Annual Meeting.

There are loyal members who will follow wherever the Association elects to go. There are other members who will say: "It is a long trip and a hard one and just why should I make a special effort to go to Texas? If it were New York City, now, etc., . . . if it were Denver, etc., etc., . . . or if it were San Francisco, etc., etc., etc. . . ." But the



American Public Health Association is going to Texas; they reiterate it in a most matter of fact way. If the individual is from New York City he is not anticipating much, for does not civilization reach the positive dead line at Buffalo? And Texas, particularly, has but wigwams, Indians and cow-punchers. Texas smiles quietly in her sleeve; too big for jealousy, too generous for fault-finding, hospitably waiting for all of the world, and the American Public Health Association in particular, to come, to find, to love, to hold a unique memory close forever.

Some of the members will travel south by automobile. They will ride for miles over well conditioned roads toward Fort Worth, the shadowy outlines of her skyscrapers appearing finally on the horizon, mystic as mirage, and dim as the fabled city of Camelot. It is the end of a long journey and the wayfarer will find peace, a good hotel, and the best and cheapest food in the land.

It is October in Texas; there is not a trace of frost in the air, for it is not yet time to think of winter. If the month were May a short excursion into the byways would reveal the lavish array of Texas wild flowers—the Blue-bonnet the queen of them all. If it were July the watermelons would be coming in by the truck load—big, juicy, sweet and luscious beyond description. There are those who having once tasted real Texas melon have thereafter refused the delicacy elsewhere. But it is October! The pecans, native to this region, and the big paper-shelled variety are almost ripe now. Citrus fruits and vegetables are shipped in every day from the Rio Grande Valley and from the Winter Garden regions of Texas. Yellow-legged chickens are cooked in regiments every day by chefs with personality. Fort Worth and this delicious southern chicken will always loom large in memory. The spirit of hospitality is evident in the various clubs. Many men's clubs

there are and one of the most delightful Woman's Clubs in the country.

The most wonderful physiological fact about Fort Worth is the rapidity of the growth of the city. In 1920, the population was 103,000; in 1930, it is reaching for the 200,000 mark. Just a few miles from Fort Worth lies Lake Worth, probably the largest artificial body of water in Texas. It was designed by the City of Fort Worth for a water supply. Two more larger lakes are to be built to supplement it.

We have said that Texas was different, yet it is hard to put the difference in words. For instance, the sun goes down and night comes to Texas, as she does all over the world. There is white magic in Texas nights. The cares of the day go far away. The heavens come down very near and the stars are very bright. The spirit is reborn; romance blooms again; and the dreams which were born of youth's inexperience return with even greater allure.

Texas is a land of history. Coronado in his search for the fabled cities of gold probably crossed the site of Fort Worth in 1541. The state has been under five flags—five different types of government. The state produces oil, cattle, wheat, corn and cotton. Of late, manufacturing is developing rapidly.

Texas has sacred ground. Men lift their hats as they pass the Alamo—that quiet shrine, where men died for Texas liberty.

It may be that this past history and the traditions of Texas are the means of stimulating in this Southwest a growth of creative effort, which is manifesting itself in the composition of music, poetry and painting.

In Fort Worth and Texas generally, flying is making phenomenal progress, the climate being conducive to its development.

Texas is the last great frontier. It is hard to realize among the skyscrapers of Fort Worth that just a few hours away

hunting for game is still a possibility. Turkey and deer may be found west of Menard, and in the head waters of the San Saba a forty-seven and one-half pound catfish was landed only this summer—and there are more fish in the San Saba.

In Texas, the distances are vast and the thought of man wanders far. Almost every Texan knows a little of geology. Oil has its lessons. The bit that grinds its way toward the golden flow passes sand after sand that was

once sea floor. Fossil deposits have yielded wonderful results. In the Public Library of Fort Worth may be seen the tusks and cranium of a mastodon, thousands of years of age.

Yes, Texas is different. So different, that once here, man would live his life within the state boundary. Here are found all that round out life—friends, change, adventure, variety of climate, desirable pursuits, and the things that dreams are made of. Where can man find more?

### WOMEN'S ENTERTAINMENT COMMITTEE

MRS. HENRY B. TRIGG

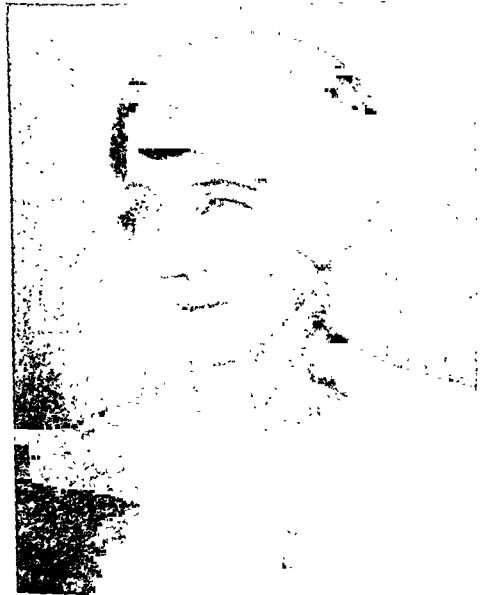
*Chairman*

THE chairman of the Local Committee has appointed a sub-committee to have charge of the entertainment for the ladies. This, of course, will include the women members of the Association and the wives and daughters of members.

The committee of women has planned several entertainment features that we hope will be of interest to our guests. Among these will be a ride over the city and adjacent country, which is indeed very picturesque in late October, and a musical tea at the Woman's Club. Fort Worth is very proud of its Woman's Club building, a most beautiful structure, located on one of our most attractive streets, Pennsylvania Avenue, and owned and supported by the women's clubs of this city. Naturally, it is the center of women's activities.

The women are, of course, invited to the barbecue and rodeo, the ride to Lake Worth, the annual banquet, and the dance to be given on the evening of the opening exercises.

The weather in Fort Worth in October is delightful for golf and the city has many country clubs and two municipal courses which will be thrown open for the use of our guests. Mrs. Pauline



MRS. PAULINE STRIPLING FRENCH

Stripling French, at one time woman golf champion of Texas, and one of our most noted golf enthusiasts, will have charge of this feature of the entertainment. Mrs. French will see that those interested in golf are furnished transportation and that arrangements are made for them to play. She would like very much to have the women bring their handicaps with them.

Automobiles will be available for those that would like to visit the health centers, universities, and other places of interest in the city, or perhaps look up some friend in Fort Worth. In other words, the committee of women will endeavor to do everything possible to make your stay in Fort Worth enjoyable

in order that you may remember it as one of the happiest occasions connected with the Annual Meetings of the American Public Health Association. We desire that our guests may feel that Fort Worth is truly typical of southwestern hospitality, for which it is known throughout the United States.

#### INVITATION TO VISIT SAN ANTONIO

An invitation has been extended by Dr. W. D. King, Health Officer of San Antonio, to stop over in that city on the way to Mexico City. This invitation has been officially authorized by the

City Health Board, Bexar County Medical Society, and the Auxiliary of the Bexar County Medical Society. Guests will be entertained at luncheon, October 31, and a sight-seeing trip has been planned.

## NEW MEMBERS

### *Health Officers Section*

G. A. Ashbaugh, M.D., Rocky Ford, Colo., Otero County Health Officer  
 A. Bossinotte, M.D., Matane, P. Q., Health Officer, Matane County Health Unit  
 Enoch M. Buckner, Dayton, Tenn., Sanitary Inspector, Rhea-Meigs County Health Unit  
 David D. Carr, M.D., LaFayette, Ala., County Health Officer  
 Arthur Caux, M.D., Lotbiniere, P. Q., Medical Officer of Health  
 Eliphalet A. Cornell, Sault Ste. Marie, Mich., Health Officer  
 Frederick U. Davis, M.D., Faribault, Minn., Health Commissioner  
 Judson D. Dowling, M.D., Birmingham, Ala., County Health Officer  
 J. Cyril Eby, M.D., Plaquemine, La., Director, Iberville Parish Health Unit  
 Edgar H. Hand, M.D., Charlotte, N. C., Assistant Health Officer, Mecklenburg County  
 Marie A. Harrison, R.N., Maplewood, N. J., Health Officer  
 Matthew J. Keough, M.D., Cohoes, N. Y., Health Commissioner  
 G. W. Luckey, M.D., Fort Worth, Tex., Assistant Director, Public Health and Welfare  
 Peel M. Payne, M.D., Napoleonville, La., Director, Assumption Parish Health Unit  
 Gerard C. Unrein, M.D., Hays, Kans., Ellis County Health Officer  
 Ludwig C. Yen, M.D., Nanking, China, Director, Department of Medical Administration (Assoc.)

### *Laboratory Section*

Paul Eaton, M.D., Jacksonville, Fla., Director, Bureau of Laboratories, State Board of Health

James C. Hofmann, Topeka, Kans., State Bacteriologist, Public Health Laboratory  
 Newton W. Larkum, Ph.D., Lansing, Mich., Immunologist, State Department of Health  
 Eloy B. Moreno, Laredo, Tex., Milk and Dairy Inspector  
 Charles Paley, B.S., New York, N. Y. (Assoc.)  
 William O. Pauli, M.D., Cincinnati, O. (Assoc.)  
 Jack Wyatt, Amarillo, Tex., City Chemist

### *Public Health Engineering Section*

Ashley G. Classen, Austin, Tex., Sanitary Engineer, Western Metal Manufacturing Co.  
 H. R. F. Helland, San Antonio, Tex., Consulting Sanitary Engineer  
 Bluford W. Jackson, Hammond, Ind., Municipal and Industrial Water Chemist  
 Mark B. Owen, Dearborn, Mich., Supt., Public Works and Engineering

### *Industrial Hygiene Section*

Muriel B. Kingsley, B.S., Chicago, Ill., Health Education Secretary, Chicago Y. W. C. A.  
 Jessie B. Love, R.N., Van Lear, Ky., General Industrial Educational Program (Assoc.)  
 Zelma Rice, Fort Worth, Tex., City Industrial Hygiene Staff

### *Food, Drugs and Nutrition Section*

E. E. Waters, Waco, Tex., Supt., Borden's Milk Company  
 Arthur H. Williamson, D.V.M., Charlotte, N. C., Supervisor, Dairy Sanitation, Health Department

*Child Hygiene Section*

- Lucile S. Blachly, M.D., Jacksonville, Fla., Director, Bureau Child Hygiene  
 Anne Douglass, R.N., Houston, Tex., Supervising Nurse, Harris County Red Cross Public Health Nursing Service  
 Mrs. May Fair, Sherman, Tex., School Nurse, City Schools  
 Mary Kennedy, R.N., Houston, Tex., Health Supervisor, DePelchin Faith Home  
 Emma G. Shannon, R.N., Fort Worth, Tex., Public School Nurse

*Public Health Education Section*

- Manuel M. Baez, M.D., Mexico, D. F., In charge hygienic education  
 Mary L. Boillin, Clarksville, Tenn., Director, Department of Physical and Health Education, State Teachers College, Fredericksburg, Va.  
 Mrs. S. I. Bolton, R.N., Nashville, Tenn., Exec. Secy., Davidson County Anti-Tuberculosis Association  
 John E. Burke, M.D., Schenectady, N. Y., Director, Health Education  
 Terence F. Cunneen, LL.B., Washington, D. C., Manager, Insurance Dept., Chamber of Commerce of United States (Assoc.)  
 Patrick H. Fleming, M.D., St. Martinville, La., Director, St. Martin Parish Health Unit  
 Jacob L. Lochner, Jr., M.D., Albany, N. Y., Assistant Medical Inspector, City Public Schools  
 John O. McReynolds, M.D., Dallas, Tex. (Assoc.)  
 Ira O. Park, M.D., Union City, Tenn., Medical Advisor, and Associate Editor *Babyhood*  
 William H. Phipps, D.P.H., Kansas City, Mo. (Assoc.)  
 Ralph A. Reynolds, M.D., San Francisco, Calif. (Assoc.)  
 N. F. Williams, D.V.S., Fort Worth, Tex., State Veterinarian

*Public Health Nursing Section*

- Addie Alexander, R.N., Ballinger, Tex., County Health Nurse  
 Christina Anderson, R.N., New York, N. Y., Supervisor of Nurses, Henry Street Visiting Nurse Association  
 Thelma M. Bailey, R.N., Fort Worth, Tex., Public Health Nurse, City Staff  
 Helen M. Bartholomew, R.N., Circleville, O., Pickaway County Public Health Nurse

- Ada L. Clark, Fort Worth, Tex., City Public Health Nurse  
 Vella M. Custer, Fort Worth, Tex., Public Health Nurse, City Staff  
 Mary J. Dunn, Nashville, Tenn., Director, Public Health Nursing, Vanderbilt University  
 Gertrude L. Ezell, R.N., Fort Worth, Tex., Nurse  
 Rhoda M. Foster, R.N., Fort Worth, Tex., City Public Health Nurse  
 Lena T. Franks, R.N., Fort Worth, Tex., School Nurse  
 Hortense Hilbert, R.N., New York, N. Y., Staff Associate, Div. of Med. Service, American Child Health Association  
 Ruth M. Knapp, R.N., Hillsdale, Mich., City and School Nurse  
 Ethel M. Lindley, R.N., Huntville, Tex., Nurse  
 Elizabeth Parks, R.N., Fort Worth, Tex., Nurse, Southwestern Bell Telephone Co.  
 Margaret G. Smith, R.N., Salem, O., Public Health Nurse, Columbiana County  
 Nell Stoltzfus, R.N., Sinton, Tex., Nurse  
 Mary E. Tucker, R.N., Fort Worth, Tex., Nurse, County and City Tubercular Colony  
 Alyce J. Wallace, R.N., Fort Worth, Tex., City Public Health Nurse  
 Minerva E. Wilson, R.N., Fort Worth, Tex., Public Health Nurse, City Staff

*Epidemiology Section*

- Percy S. Pelouze, Philadelphia, Pa., Member, Medical Advisory Board, American Social Hygiene Association

*Unaffiliated*

- Emmett Fayen, M.D., Cincinnati, O., Assistant Medical Director, Union Central Life Insurance Co.  
 F. W. Felthouse, San Antonio, Tex. (Assoc.)  
 William R. Hendrix, Murfreesboro, Tenn., Sanitary Officer, Health Department  
 Edward Kuck, M.D., Cincinnati, O. (Assoc.)  
 Greene L. Red, M.D., Charlotte, N. C., Venereal Disease Clinic, City Health Department  
 Edward F. Sherman, Pasadena, Calif. (Assoc.)  
 William H. White, M.D., Keene, N. H., Resident Physician, Southern American Gold & Platinum Corp.

*Sustaining Members*

- Nye Odorless Incinerator Corp., Albany, Ga.

## APPLICANTS FOR FELLOWSHIP

HEALTH OFFICERS: Fred T. Foard, M.D., Santa Barbara, Calif.; John J. Sippy, M.D., Stockton, Calif.

LABORATORY: A. R. M. MacLean, Montreal, Canada; Charles Henry Adams, Indianapolis, Ind.

PUBLIC HEALTH ENGINEERING: Hyman H. Gerstein, Chicago, Ill.; Maurice Henry Coblenz, Baltimore, Md.

FOOD, DRUGS AND NUTRITION: Prof. Walter H. Eddy, New York, N. Y.

PUBLIC HEALTH NURSING: Winifred Rand, R.N., Detroit, Mich.

CHILD HYGIENE: Irl Brown Krause, M.D., Jefferson City, Mo.

INDUSTRIAL HYGIENE: Floyd P. Allen, Cincinnati, O.; Royd R. Sayers, M.D., Washington, D. C.

VITAL STATISTICS: Mary V. Dempsey, Washington, D. C.; T. F. Murphy, M.D., Washington, D. C.

PUBLIC HEALTH EDUCATION: Saidie Orr-Dunbar, Portland, Ore.; Jeanie M. Pinckney, Austin, Tex.

UNAFFILIATED: Edward Everett Hamer, Carson City, Nev.; Fitch C. E. Mattison, M.D., Pasadena, Calif.; A. Grant Fleming, M.D., Montreal, Can.; William Ford Higby, San Francisco, Calif.; Edward Desmond Hopkins, Fort Worth, Tex.

## FORT WORTH HOTEL RESERVATIONS

THE attention of delegates to the Fort Worth Annual Meeting is called to the fact that there is a shortage of single rooms in the headquarters hotel.

The Hotel Committee ask that reser-

vations for single rooms or other accommodations be sent in as soon as possible. They would appreciate an indication as to whether delegates will be willing to share rooms with others during the convention.

*A complete list of Fellows and Members of the American Public Health Association, as of August 1, 1930, will be published in the October issue of the Journal.*

# PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

**Nursing Technic in Minneapolis—**Dr. J. A. Myers of Minneapolis, in a paper (in press) presented before the nurses associations recent meeting in Milwaukee, emphasized the importance of strict contagious disease technic in the nursing of tuberculosis, directed primarily toward the protection of the nurse. The project is under way in Minneapolis to establish in the contagious building of the Minneapolis General Hospital, in co-operation with the Minneapolis Health Department, a 20-bed ward where student nurses are to be given strict contagious disease technic training in tuberculosis nursing. It is believed that this is a forward step in nursing technic for a general hospital and it is hoped that the demonstration will be of value to general hospitals throughout the country in teaching this important subject for the safeguarding of the health and lives of nurses engaged in the nursing of tuberculous patients.—F. E. Harrington, M.D., Health Commissioner, Minneapolis, Minn.

**Undulant Fever—**During the past year investigations have been carried on by the U. S. Public Health Service along two lines. Dr. Hardy, in Iowa, has studied approximately 200 cases occurring in that state in 1929 which, added to those previously investigated, provides a total of 375 cases for his epidemiologic study. Dr. Hasseltine has investigated 109 cases in 14 different states. Of 442 cases for which epidemiologic data are available, 198 are placed in the milk group, having occurred in individuals who have not been exposed to livestock. There are 200 cases in the farm group, people living in

the country who have direct contact with livestock. There are 44 cases in the meat group, urban cases having direct contact with livestock or carcasses.

There have been 13 cases in children under 10 years of age. The greatest incidence has been in the age group 35 to 44. Simpson has collected 1,305 cases in the United States.

Pasteurization of milk is an effective means of protecting against milk-borne infection. Arnold, in the January issue of the *Health Messenger* of the Illinois State Board of Health, reported that 140° F. for 40 minutes was required to kill certain strains of *Brucella abortus*. He did not, however, give any details, and the temperature which he used is 2° or 3° below the standard pasteurization temperature. The epidemiologic studies indicate that where milk has been a factor in the spread of infection, the supply had not been pasteurized. In two cities, Frederick, Md., and Waycross, Ga., ordinances have been passed requiring that all milk be pasteurized. The immediate factor stimulating the passage of such ordinances was outbreaks of undulant fever due to raw milk.

Undulant fever can also be contracted by means of transmission other than milk. Contact with infected animals, particularly infected hogs, may result in infection. While the serological examination of livestock is a practicable method of attacking the problem of undulant fever, for the present at least, we must rely upon the education of those whose occupation subjects them to the hazard to guard against contact infections, and upon pasteurization to prevent milk-borne cases. Pasteurization

of the milk renders it safe and takes care not only of undulant fever but of all other communicable diseases transmitted by milk.—H. E. Hasseltine, Recent Progress in Studies of Undulant Fever, *Pub. Health Rep.*, 45, 1660 (July 18), 1930.

**Diphtheria Prevention in New York**—The total number of children immunized against diphtheria during the first 6 months of 1930 is less than for the same period of the preceding year when 124,000 children were immunized. This indicates the great difficulty in reaching people in a large city. The campaign has yielded valuable results with low figures in cases and deaths from diphtheria as shown by tables presented.—*Week. Bull.*, New York Dept. of Health, June 28, 1930.

**Public Health in Iowa**—A study has been made of the public health machinery of Iowa, official and unofficial, and its relationship and coordination with the State Health Department. The present organization and divisional activities of the State Health Department have been studied and recommendations for reorganization enumerated. Iowa spends less per capita each year for public health than any other state in the Union. In 1925 the average per capita expenditure for 48 states was 9 cents. Iowa was at the bottom of the list of the 10 states which appropriate less than 5 cents per capita, the amount for this state being 2.4 cents. It is recommended that as a beginning this be increased to 5 cents.

Instead of building up a large central organization for the supervision of health activities it is recommended that local units of the county type be created and maintained under constant supervision and control of the State Health Department. A full-time county health department will most adequately meet the health needs of each local district.

It is recommended that the State Medical Society recognize and accept the obligation for providing adequate medical advice and treatment for all citizens at a reasonable cost. The Governor should appoint a special public health advisory council for the purpose of coordinating all public health activities in Iowa.—A. J. McLaughlin, A Public-Health Survey of Iowa, *Pub. Health Rep.*, 45, 1573 (July 11), 1930.

**Tuberculosis Service in Cattaraugus County**—Beginning January 1, 1923, through the cooperation of the Milbank Memorial Fund, the first rural county-wide organization for the control of tuberculosis was established in New York State. In that year a County Board of Health was created with one bureau devoted to tuberculosis control. The county with its 75,000 inhabitants and 1,343 square miles was divided into 6 administrative health districts with case finding, clinic, nursing and medical personnel available for each district.

During the 10 years prior to the beginning of this demonstration, there was reported an average of 1.4 new cases per annual death. In 1924, the first year of the campaign, the cases reported as active, apparently arrested, or arrested, gave a ratio of 6.9, which obviously was a cumulative ratio. For 1927 there were 3.7 new cases reported per annual death.

One of the first undertakings in 1923 was the preparation of a living case file. The list of 237 cases was carefully checked and of this number, 102 cases were cancelled, as the patients had either moved from the county, died, or could not be located. In 1923 there were 135 known cases of tuberculosis. In 1927 there were 636 known cases.

In 1926 particular attention was devoted to the examination of contacts. Thirty-two per cent of all cases diagnosed as tuberculous gave a history of tuberculosis in their immediate family.

During the 5-year period 1923-1927, a total of 7,171 persons was examined especially for tuberculosis, or approximately 10 per cent of the entire population of the county. Home treatment for special types of cases which were not hospitalized was given particular emphasis. It has been found that for adequate diagnostic service there should be available a half-day clinic per month for every 5,000 to 8,000 population. It is too early to evaluate the results statistically.—Stephen A. Douglass, *The Organization of a Rural Tuberculosis Service*, Milbank Memorial Fund, 1930.

**Los Angeles County Health Department**—Los Angeles County was the first county government in the United States to attempt to bring together under one roof health department, emergency medical and surgical service, clinics for the indigent sick, school health service, social service, and other related work in the community, combining the resources of the county government, the municipality and the school district. The first major unit was established for the San Fernando District in 1926. At present there are 13 districts, each having a complete health department or-

ganization. Each unit consists of the following services: (1) community public health, including communicable disease control, sanitation and preventive medicine; (2) school hygiene and educational work under the direction of local school authorities; (3) service to the indigent sick or dependent poor including emergency hospital and clinic work manned by voluntary physicians serving without pay; (4) coördination of social services, medical as well as county division of welfare work.

For the year 1927 the Los Angeles County Health Department was appraised by representatives of the American Public Health Association and scored 820 points out of a possible 1,000.

Preschool hygiene rated 100 per cent; laboratory work and popular health instruction and prenatal work scored over 90 per cent while sanitation, infant hygiene, vital statistics and tuberculosis were rated each approximately 80 per cent. The weakest divisions of the department were venereal disease and communicable disease control.—J. L. Pomeroy, *Report of Los Angeles County Health Department*, June 30, 1929.



# LABORATORY

C. C. YOUNG, D. P. H.

## PREPARATION OF ACIDOPHILUS MILK FROM MILK TREATED BY ELECTRICITY\*

E. D. DEVEREUX

*Michigan Agricultural Experimental Station, Michigan State College,  
East Lansing, Mich.*

### REVIEW OF LITERATURE

BEFORE a desirable cultured milk of any type can be prepared it is necessary to reduce the bacterial content of the milk to be inoculated to a negligible quantity. Heat has been the common means and several temperatures and exposure periods are being used.

In the preparation of *Lactobacillus bulgaricus* milk Hammer and Hauser (1916)<sup>1</sup> stated that, if the original milk was very clean, pasteurization at 82° to 93° C. for 30 to 40 minutes might be satisfactory; but if not, double pasteurization was ordinarily effective. This consisted of pasteurizing on two successive days with thorough cooling during the time between heatings. Hammer also suggested that when large lots of the milk were to be prepared double pasteurization was advisable unless the milk was very clean.

For the preparation of *Lactobacillus acidophilus* milk, Prucha and Brannon (1926)<sup>2</sup> pasteurized skim milk of a good quality at 79° to 80° C. for 30 minutes, cooled to 37° or 38° C., allowed it to stand 3 to 4 hours, and then repasteurized. Kopeloff (1926)<sup>3</sup> suggested pasteurizing skim milk at 90° to 93° C. for 1 hour. The milk was then cooled to 37° C. for 3 to 4 hours and repasteurized.

Reichart and Davis (1928)<sup>4</sup> are of the opinion that the above mentioned

methods are rather tedious and the results somewhat uncertain. They suggest heating the milk under a pressure of 12 to 15 lb. at a temperature of 118° to 121° C. for 30 minutes.

In all of the above mentioned methods for preparing acidophilus milk, a 2 to 3 per cent inoculum of *L. acidophilus* was used, and the milk incubated at 37.5° C. for 18 to 36 hours.

### EXPERIMENTAL

During the past year several phases of pasteurization of milk by electricity have been studied, and in connection with these studies a commercial plant using the electrical method was visited frequently. This plant was using the Electropure process<sup>5</sup> operating at 70° to 71° C. Samples of raw milk were taken and large samples (1 to 2 liters) were taken following treatment. Plate counts were made according to the *Standard Methods of Milk Analysis* (Fifth Edition), 1927 (Table I). Since only a small portion of the treated milk was used for plating, a large quantity was left for experimental purposes; this was inoculated with about 2 to 3 per cent of a 24-hour culture of *L. acidophilus* and incubated at 37.5° C. for approximately 24 hours.

In every case a desirable product resulted. The curd was fine, soft, easily broken, and very little whey expressed.

TABLE I

Sample No.	Raw Milk	Electro- pure Milk	Percentage Reduction
1	130,000	2,500	98.08
2	400,000	2,000	99.50
3	400,000	2,800	99.30
4	450,000	3,000	99.33
5	40,000	7,000	82.50
6	60,000	5,000	91.66
7	375,000	2,000	99.47
8	26,000	4,800	81.54
9	110,000	2,000	98.18
10	150,000	4,000	97.33
Average	214,100	3,510	98.34

The milk had a taste of freshly soured milk and since the heating was not sufficient to caramelize it there was no decided cooked flavor. Microscopic examination revealed that the growth of organisms remaining in the original milk was unimportant.

#### DISCUSSION

Milk electrically pasteurized, in a manner no different from that employed

for sale as liquid milk, appears to be suitable for the production of acidophilus milk. The bacterial content of the original milk was reduced to a negligible quantity.

This method of preparing cultured milk has several distinct advantages: (1) ease with which the milk can be prepared for inoculation, (2) whole milk can be used, (3) no special sterilizing equipment is necessary, and (4) a product with a fresh sour taste and not a cooked taste or color is produced.

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- \* Journal Article No. 34, New Series, from the Michigan State College Agricultural Experiment Station.

## AN IMPROVED DRYING PLATE

M. O. ROBINSON, V. M. D.

*Scott-Powell Dairies, Philadelphia, Pa.*

**D**IRECT microscopic examinations of milk samples have become one of the chief control measures in many laboratories during the past few years. It is a worth while system, and has many advantages.

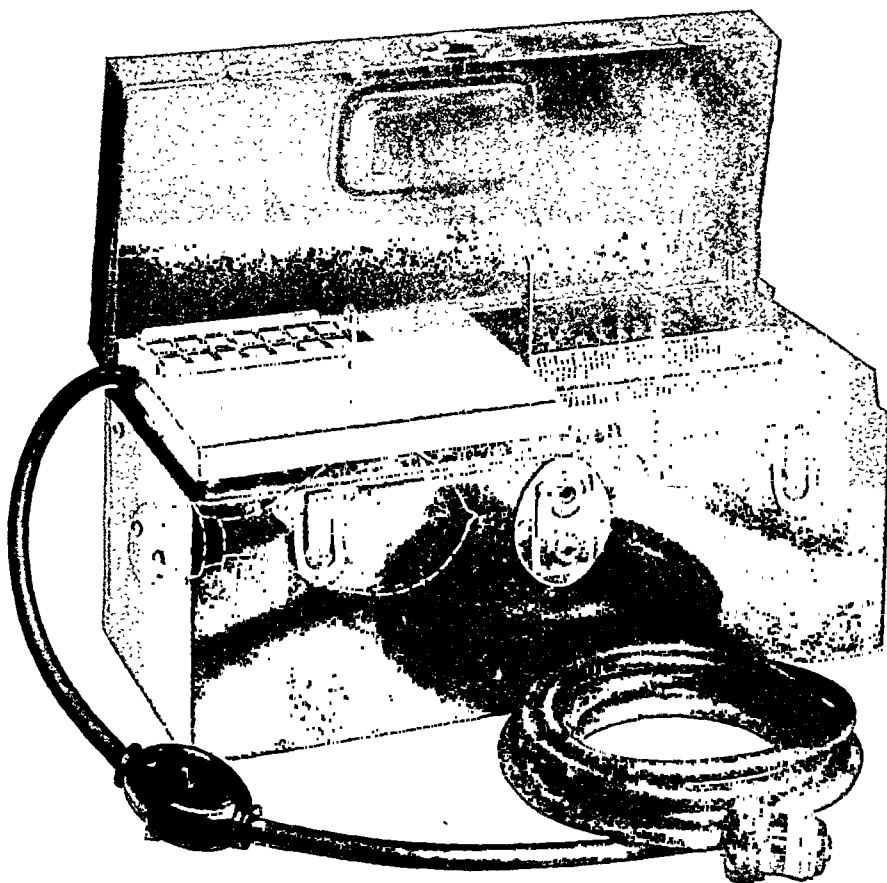
The Scott-Powell laboratories have used this method quite extensively in their daily control work. Several obstacles had to be overcome in adapting this method to our work; namely, the production of a compact portable outfit, which could be used for hours at a time without attention from the operator.

To meet this demand, we have designed an outfit that has been giving us

excellent service for over two years; and at the present time we are using three such outfits in our control work.

The outfit consists of a small metal carrying case, divided into two compartments. One compartment is asbestos lined, and is covered by a tinned copper plate. This plate is automatically kept at a constant temperature by means of an electric light, which is thermostatically controlled. The thermostat is adjustable to any temperature, to suit the individual operator. When not in use, the 18 ft. of extension cord can be readily coiled up within this space.

The other compartment contains



*Improved Drying Plate*

metal slide racks of a standard size, so that the whole rack may be dipped into standard staining jars; allowing 20 slides to be stained at one time. There is also a place for pipettes, needles, etc.

On the hot plate, there is a special arrangement for holding the standard size card, for guiding the operator. This card is held in place by a spring arrangement, which also holds the slide firmly in place during the operation of making the smear.

Under actual working conditions we find that this piece of equipment has been of great value to us, in that it is compact, sturdy, and accurate in operation; preventing overheated smears, with the resulting loss of time, and possibly lost samples.

This piece of equipment will be put on the market by the Arthur H. Thomas Company of Philadelphia, under the name of "Robinson Warm Plate and Staining Rack."

## DETECTION OF INDOL IN BACTERIAL CULTURES

D. C. B. DUFF

*Department of Bacteriology, University of British Columbia, Vancouver, B. C.*

DURING recent experiments on the production of indol by various bacterial strains, it was found that the sensitivity of the paradimethylaminobenzaldehyde test, for small quantities of culture (5 c.c.), could be considerably increased by dialyzing the culture into an equal volume of isotonic saline, and performing the test upon the dialysate instead of upon the crude culture. This result is peculiar since presumably only up to one-half of the total indol present can be in the dialysate. Nevertheless, an actually deeper color is given by the chloroform extract from the reaction performed on the dialysate than is given by the extract with the undialyzed culture. Blank tests showed that this intensification of extract color was not in any way due to materials in the dialyzing membrane. The clear test solution afforded by dialysis has the further advantage that the chloroform extracts from such a solution are always clear, thus facilitating comparison with standards. When the crude culture is tested, the extract frequently tends toward cloudiness, due to precipitates formed during the reaction.

Table I refers to results obtained from 5 c.c. peptone water cultures of a

non-indol producing organism (*Staph. citreus*) to which known amounts of indol were added just before placing in the icebox. One series of cultures was dialyzed by the method given. The other series was not dialyzed. The chloroform extracts from both series were compared with color standards freshly made from known aqueous solutions.

It is seen that with crude cultures color begins to show at about 12 mmg., whereas with the dialysates amounts as low as 1 mmg. may be detected (i.e., 0.5 mmg. or less in the dialysate). As the amount of indol is increased, the value found for the dialysate tends to approach more closely one-half of the total amount of indol originally present in the culture. A smooth curve could not be drawn of this approach, possibly due in part to the gap of 2 mmg. between standards, and the impossibility of accurately judging values between standards. It should be mentioned that the dialysis method was also attempted with cultures of bacteria grown in macerated salmon flesh. Satisfactory results were not obtained, due to the passage through the cellophane membrane of substances which formed a heavy precipitate in the test. The use, however, of another type

TABLE I

Mmg. Indol in culture		0	0	1	2	4	8	12	16	20	24	30	34	40	44	50	100
Mmg. Recovered in Test	Not Dialyzed	—	—	—	—	—	—	trace	2	5	6	8	8	10	10	14	30
	Dialyzed	—	—	trace	trace	1.5 apx	3	5 apx	6	8	10	12	15 apx	18	20	24	50

of membrane might make it possible to apply this method to testing the production of indol in spoiled fish or meat. At present the most satisfactory method for such determinations is that of steam distillation as described by Clough.

#### TECHNIC

Cellophane\* was the dialyzing membrane used. This material has been described by Hill, and by Wilson, as a sterilizable dialyzing membrane useful in bacteriological procedures. The organism to be tested is inoculated into 5 c.c. quantities of tryptophane broth in 5" x  $\frac{1}{2}$ " lipless tubes. After 48 hours' incubation, the cotton plugs are removed and an unpunctured sheet of cellophane, about 6" x 6", is folded down tightly over the mouth of each tube by means of several turns of a rubber band. The cellophane tube or bag thus formed is then slid part way off the test tube, still remaining bound to it by the rubber band. The test tube is now inverted, allowing the culture fluid to fall into the dialyzing bag. The inverted test tube with its dependent bag is then hung within an 8" x 1" tube containing 5 c.c. of a saline solution isotonic with the medium. The unit is placed in the ice-box for 24 hours. The bags are removed, and any fluid adhering to the outer surface is washed down into the dialysate with a few drops from a wash-bottle. The clear dialysate is then pipetted off into a 6" x  $\frac{5}{8}$ " tube, in which it is subjected to the test. Comparison

with color standards is facilitated if the chloroform extract is pipetted off into a still smaller clear glass tube which is placed in a comparator with the standards.

Icebox dialysis is particularly necessary in the case of cultures of motile organisms, which may at higher temperatures penetrate the membrane in such numbers as to cloud the reaction. Formalin as an immobilizing agent is useless, since even in very low concentrations it has the effect of almost completely inhibiting the reaction. Other antiseptics were not tried.

Clough has given a comprehensive review of the various tests for indol and skatol. He recommends a modification of the Ehrlich test. This has given complete satisfaction in this laboratory, and for convenience is reproduced below.

#### Reagents:

- (a) Paradimethylaminobenzaldehyde, 2 gm. in 100 c.c. of 95 per cent alcohol.
- (b) HCl, 600 c.c. concentrated plus 200 c.c. water.
- (c) Chloroform, U. S. P.

#### Method:

To 5 c.c. of the test solution add 0.5 c.c. reagent (a) and 1 c.c. reagent (b). Place in boiling water bath for 20 seconds, shaking vigorously, then place in ice water  $\frac{1}{2}$  minute, and extract with 1 c.c. reagent (c). Comparison is made with standards made in the same way.

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\* Manufactured by the DuPont Cellophane Co., Buffalo, N. Y.

# VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

**Post-Sanatorium Histories of Tuberculous Cases**—The present study is a report of after-histories of 7,000 patients discharged from two state sanatoriums. The largest group of men in both institutions were skilled workers and the largest group of women, housekeepers. The age at admission ranged from 10 to 60 years.

At the end of the 5th year after discharge, there were complete records for 190 minimal, 318 moderately advanced, and 57 far-advanced cases. Seventy-two per cent of the patients in the minimal stage worked the entire 5 years and 8 per cent worked continuously after the first year. The moderately advanced cases reported 69 per cent working for the 5 years and 8 per cent working after the first year. The far-advanced cases showed 46 per cent working the entire period and 2 per cent after the first year. Only 7 per cent of the far-advanced cases did not work at any time during the 5 years.

After 10 years, there were living 31 minimal, 63 moderately advanced and 10 far-advanced cases. Of these, 58 per cent of minimal, 68 per cent of moderately advanced, and 33 per cent of far-advanced worked the entire period.

Fifteen years after discharge, 62 per cent of the minimal cases were living, and 82 per cent of these were known to be working. Of the moderately advanced cases, only 30 per cent were living in the 15th year and 78 per cent of these were known to be working. The far-advanced cases died very rapidly; in the 15th year only 8 per cent were alive.

Women who entered sanatoriums between 20 and 29 years of age in the minimal stage showed the best survival

rates. In both the minimal and moderately advanced stages, women under 20 died more rapidly than men of the same age. For women already far-advanced when entering, the ages 30 to 39 seemed most favorable. Age was a more direct factor with men. Males in the moderately advanced stage had less chance of living if in the age group 20 to 29 than if under 20 or between 30 and 39 years of age.

The length of sanatorium treatment directly affected far-advanced cases and moderately advanced for the first few years after leaving the sanatorium but the effect on minimal cases was not so direct. Weight was shown to be a positive factor in the history of tuberculous patients after leaving the sanatorium, those gaining most while in the sanatorium having the best chance of living for a long period. No definite relationship was shown between nativity and length of life in tuberculous patients.—J. S. Whitney and B. A. Myers, *Am. Rev. Tuberc.*, 691: 701 (May), 1930.

## Marriage and Divorce Reports: 1929—

**Arizona**—During 1929, there were 7,405 marriages performed in Arizona as compared with 6,400 in 1928, representing an increase of 1,005 or 15.7 per cent. The increase is attributed to the fact that the marriage laws in California now require 3 days notice to be given before issuing a marriage license and many residents in California go to adjacent counties in Arizona to be married. This was noticeable in Yuma County where there were 274 marriages in 1926 and 2,190 in 1929.

There were 1,085 divorces granted in

Arizona in 1929 against 1,062 in 1928, an increase of 2.2 per cent. There were 24 marriages annulled in 1929 compared with 19 in the preceding year.

*Minnesota*—Minnesota has reported 24,109 marriages for 1929 compared with 23,249 performed in 1928, an increase of 860 or 3.7 per cent. There were 8.7 marriages per 1,000 population in 1929 against 8.5 in 1928. There were 2,861 divorces granted in 1929, representing an increase of 0.6 per cent over the preceding year. The number of divorces per 1,000 population was 1.037 in 1929 as against 1.045 in 1928.

*Washington*—The number of marriages for 1929 in Washington increased 4.5 per cent over 1928; there were 19,685 marriages performed in 1929 and 18,833 in 1928. Divorces, however, showed a decrease of 1.5 per cent from 4,554 in 1928 to 4,486 in 1929. Annulments increased from 58 in 1928 to 64 in 1929. The number of marriages per 1,000 population was 12.2 in 1929 against 11.9 in 1928, and the number of divorces was 2.78 per 1,000 population in 1929 against 2.87 in 1928.

*Utah*—The number of marriages in Utah in 1929 was 11.6 per 1,000 population compared with 11.0 in 1928. The actual number of marriages performed was 6,286 in 1929, representing an increase of 7.6 per cent over 1928. There were 1.88 divorces per 1,000 population in 1929 against 1.92 in 1928. The number of divorces was 1,016 in 1929, a decrease of 6 or 0.6 per cent since 1928.

*Vermont*—The Department of Commerce has announced that there were 2,712 marriages performed in Vermont during 1929 as compared with 2,997 in 1928, a decrease of 9.5 per cent. The marriage rate per 1,000 population was 7.7 in 1929 against 8.5 in 1928. There were 406 divorces granted in the state in 1929, an increase of 2.5 per cent over 1928. The divorce rate per 1,000 population was 1.15 in 1929 and 1.12 in 1928.

*Connecticut*—Connecticut reported an increase of 5.6 per cent in marriages in 1929 over 1928, the number performed being respectively 12,303 and 11,650. There were 1,221 divorces granted in 1929 as compared with 1,276 in 1928, a decrease of 4.3 per cent. The marriage rate for 1929, 7.2 per 1,000 population, was higher than that for 1928, 7.0; the divorce rate fell from 0.77 per 1,000 population in 1928 to 0.72 in 1929.—

U. S. Bureau of Census, *Preliminary Reports on Marriage and Divorce: 1929*.

**German Cancer Statistics**—During the period 1923–1927, 185,600 persons died of cancer in Prussia; of these 81,200 were men and 104,400 were women. The digestive organs were involved in 129,500 persons; reproductive in 26,700; respiratory, 5,700; urinary organs, 3,975; and in only 1,990 the external covering of the body. About 2 per cent of the cases were in organs of sense, the nerves, bones and joints. No reference to site of cancer was given in from 4 to 5 per cent of cases. Involvement of digestive organs was about 6 per cent lower in females than in males; cancer of respiratory organs was a little lower in females than males and cancer of the urinary organs was only a trifle more than two-fifths of that of the male sex. In cancer of the reproductive organs, women presented about 15 times as many fatal cases as men.—*Med. Off.*, 43: 285 (June 21), 1930.

**Population Decreases in German Cities**—From 1900 to 1927, there was a rapid decrease in the excess of births over deaths in all the large German cities. Berlin had an excess of deaths over births; in 1900, Berlin's excess of births over deaths was 7.7 per cent and in 1927 the excess of deaths over births amounted to 1.4 per cent. In Munich, the capital of Bavaria, the excess of

births over deaths in 1900 was 10.6 per cent; then there was a downward trend, until in 1927 the low point of 0.9 per cent was reached. Only slightly better were the reports from Dresden with 1.2 per cent, Hamburg with 1.4 per cent, Frankfort-on-Main and Magdeburg with 1.6 per cent, Altona with 1.7 per cent and Leipsig with 2.0 per cent. In the remaining large German cities, the figures were somewhat higher but in few was the excess of births over deaths above 10 per cent, whereas in 1900 the percentages ranged from 15 to 20, and in one case, 34 per cent.—*J. A. M. A.*, 94: 1856 (June 7), 1930.

**Body Weight and Certain Causes of Death**—High death rates from the degenerative diseases among overweights cause a marked reduction in their life expectation. Persons who are underweight, on the other hand, have high death rates from the respiratory diseases, but this unfavorable feature is usually balanced by their low death rates from the degenerative diseases. Although these general observations were made many years ago, there has been little extensive information regarding the mortality from the important causes of death in various weight groups. Fortunately, records of the Union Central Life Insurance Company, made available to the Statistical Bureau of the Metropolitan Life Insurance Company some years ago, have made possible an analysis of this kind. The following represents a summary of the more important results of the investigation recently published in *Human Biology*, May, 1930.

Taking the death rate of the normal weight group as 100 per cent, it was found that overweights, as a whole, had a mortality from heart disease 151 per cent of the average. Similarly, the death rate of overweights from nephritis was 172 per cent of the normal; from arterial diseases, 165 per cent; from

cerebral hemorrhage, 157 per cent; and from cancer, 111 per cent. There were appreciable excesses in the death rates among overweights from angina pectoris, influenza, paralysis, appendicitis, cirrhosis of the liver and typhoid fever. The accident and suicide death rates among overweights were also higher than the average. Underweights, on the other hand, show generally lower death rates from the above causes. The mortality from heart disease was only 81 per cent of the average; from nephritis, 77 per cent; from arterial diseases, 74 per cent; from cerebral hemorrhage, 70 per cent; and from diabetes, only 64 per cent. The mortality from cancer among underweights, as a class, was approximately the same as among normals.

Of the diseases which showed high death rates among underweights, tuberculosis stood first by a wide margin. As a group, their mortality from this cause was 202 per cent of the normal, but among those 15 per cent or more underweight it was 291 per cent. The death rate from pneumonia was also high among underweights. As a class, their mortality from this disease was 111 per cent of the normal, but it was even higher among those who were extremely underweight. No other important disease caused a relatively high death rate among underweights.

It would seem that the high death rates among overweights from the degenerative diseases is largely due to the burden of work put on the heart, kidneys and blood vessels by the extra body bulk. Overweight is often due to the dietary habits and the mode of life of the individual and such overweight can be modified with great benefit to health and longevity. Taken altogether, underweight, biologically, seems to be an asset. It represents the most efficient type in respect to metabolism.

The present study, then, confirms the previous observation that persons who approach the mean of build or weight



are best suited to withstand the hazards of life. The greatest problem today in the field of public health is to keep down the mortality in middle and later life, and it is not unlikely that public appreciation of these facts regarding body weight may help in its solution.—*Stat. Bull., Met. Life Ins. Co.*, 11: 4-6 (June), 1930.

### The Causes of Neonatal Deaths

—A study of 800 cases of death within the first 28 days after birth has been made in Glasgow. In this series 71 per cent of the infants died within 7 days. Of the remainder, 18 per cent died during the second week, 8 per cent during the third week, and 3 per cent during the fourth week.

The two main groups of causes of death among new-born infants are injuries or disturbances due to delivery and illness or infection. In this series there were 540 cases of asphyxia neonatorum in the first group, 140 mature and 400 premature. In 51 of them, some pneumonic consolidation was found. Many of these showed birth injuries; 146 had gross intracranial hemorrhage, and 121 had tears in the dura. Sixteen of this group showed mental anomalies and 15 of them had syphilitic mothers.

Generalized septicemia was found in 120 infants, often in association with pneumonia. Pneumonia was the most common lesion, appearing in 197 cases,

and in practically two-thirds of all non-asphyxial or atelectatic cases. Infections of the gastrointestinal tract were rare in this series even after a history of diarrhea and vomiting. One premature infant had appendicitis associated with generalized septicemia. Peritonitis was present in 21 mature and 23 immature babies. One child had jaundice due to obstruction by a congenital band and two had splenomegaly.

There was gross intracranial hemorrhage in 161 cases, 86 per cent of whom died within the first week and 36 per cent during the first day. Twenty cases showed some form of infection while the remainder died from asphyxia and atelectasis. Meningitis occurred in 33 cases, most of the infants dying between the 5th and 13th day. It was associated with septicemia in 29 cases and with pneumonia in 12 cases. There were 17 examples of abnormality of the central nervous system.

Cellulitis was found in 19 mature and 10 premature infants and swabs revealed streptococci in 10 cases, staphylococci in 7 and coliform bacilli in 3 cases. The 6 cases of pemphigus included were part of an epidemic of 15 cases of whom 7 died from general sepsis. There were 30 cases of thrombosis; in 11 of these the mother had some form of toxemia. The Wassermann reaction was positive in 26 cases. Congenital syphilis is not a common cause of neonatal deaths.—*Lancet*, 1: 1032-1034 (May 10), 1930.

# PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

## SANITATION OF "PULLMAN CITIES" AT SHRINE CONVENTION

Toronto, June 9-12, 1930

J. ROSS MENZIES

*District Engineer, Department of Pensions and National Health,  
Montreal, Canada*

WHEN it became definitely known that the 1930 Convention of the Masonic Shrine would take the form of an International Peace Celebration at Toronto, Canada, the various official bodies concerned took measures to maintain a high standard of sanitation at the temporary living quarters provided by the Pullman cars to prevent outbreaks of communicable diseases. When consideration is given to the possibilities of such outbreaks, where representatives are gathered from all parts of Canada, the United States and adjacent countries, the necessity for such action is readily apparent.

Experience with a similar convention at Miami, Fla., and all other information and data on this particular phase of sanitation were reviewed. There then were held two meetings, one in April and the other in May, to consider in detail the sanitation of steamships in local waters and the sanitation of the two concentrated areas wherein the Canadian National and Canadian Pacific Railways proposed to establish two Pullman cities.

The groups coöperating in these meetings included the Department of Health, Toronto; the National Department of Health of Canada; the Commission of Parks, Toronto; the Departments of

Works and of Street Cleaning, Toronto; two Shrine committees, and the two railroads involved. The representatives of these groups worked out the general plan of procedure which is explained here in more detail.

Steamships to be used in lieu of hotel accommodations were required to obtain their drinking and culinary water from safe shore sources. Such vessels had to be equipped with retention tanks for raw sewage, which was not allowed to be dumped within ten miles of any water works intake, and then only after having been boiled for 30 minutes. The application of the regulations regarding vessel sewage disposal was obtained with the coöperation of the U. S. Public Health Service.

Representatives of the railways agreed to make adequate provision of men and materials so that difficulties experienced at Miami would not be repeated. Precautions included screening of sewage, protected covering between toilet outlet and sanitary can, and provision for disinfection of sanitary equipment and grounds around disposal sheds and cars. The Toronto Department of Street Cleaning arranged for continuous removal of garbage from the coach yards.

Both the Canadian National and the Canadian Pacific Railways erected

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Both the Canadian National and the Canadian Pacific Railways erected

galvanized iron construction and was located at the north side of the yard over a city sanitary sewer. Two hoppers were provided into which the cans were emptied. These hoppers had special flared tops to prevent back splashing. Water jets played over the interior continuously and another jet discharging upward in the hopper and controlled by a foot valve was used in washing out the cans as soon as they were emptied. The cans were then sprayed with a disinfectant by means of a compressed air gun and were then ready for use once more. A special screen was provided, about  $2\frac{1}{2}$ ' below the hopper mouth, to intercept bottles and other large articles which would be liable to clog the sewer. A 2" pipe connection was also made to the sewer and liberal quantities of water were discharged into it from time to time to assist in washing away solid material. Disinfectant was sprayed freely around the disposal shed and on the trucks used for transporting cans. To assist in the absorption of waste water and spillage from sanitary cans, about 3" of gravel and sand were placed between the rails and the concrete walks and this was raked or turned over as occasion demanded.

Watering cans were provided for spraying the ground around coaches but it was not found necessary to use much disinfectant in this way.

Special temporary buildings were provided for shower baths. These were of frame and galvanized iron construction. Water was heated in a large tank connected to the yard steam lines, and the hot water was kept in constant circulation by a centrifugal pump. In the women's section, the showers were divided into two parts by waterproof curtains, the outer compartment being supplied with a bench and used as a dressing room. Mirrors were hung in the aisle and attendants distributed soap and towels. In the men's section, there was only one compartment to a shower

and benches were provided in the aisle. The spraying device was connected to the hot and cold water pipes by a rubber hose. The hose used originally was found to be too light, and some trouble occurred because it became disconnected. This difficulty was overcome by using heavier hose. A charge of \$.25 was made for a shower.

Garbage was collected in covered metal cans and transported on trucks to an enclosed yard where it was sorted and dumped into city wagons. These were removed to the city incinerator by the city street cleaning department on a schedule of continuous service.

Toilet and rest rooms were located in the administration building at the eastern end of the yard; fire hydrants were provided throughout the yard and chemical extinguishers were also available. In addition, city fire alarms were placed in the yard. Barber shop, beauty parlor, lunch counter, information bureau and taxi service were all available within the yard. Electric light standards supporting two lights with reflectors were located at regular intervals along the concrete walks and provided ample light.

At the "Temple Park Annex" coach yard of the Canadian National Railway, everything was handled in the same way as in the main yard with minor exceptions.

Showers, toilets, wash rooms and an information bureau were to be found in a building at the south side of the yard. A disposal shed similar to that in the main yard, but with only one hopper, was placed at the east end of this building, and a latrine for the use of employees was located at one end of the disposal shed. This was supplied with sanitary cans which were removed from time to time, through a flap door, by the disposal shed attendant to be duly emptied and disinfected.

The walks in this yard were of plank and were located between alternate rows

of cars. Between rows not occupied by walks a narrow gauge track was laid, with turntables at convenient points, and small trucks, pushed by hand, were used in transporting ice and sanitary cans. Water hydrants were located on temporary pipe lines laid on the surface of the ground and were nearly at ground level. They were equipped with steam hose couplings for the ready attachment of service hose.

Considerable ingenuity was displayed in this yard in connecting sanitary cans to toilets. Stove pipe elbows were found very useful in some cases.

Ninety-seven coaches were located in this yard and 45 men were employed to care for them. Seven men supplied water, 8 supplied ice, 19 acted as sanitary men, and 11 were engaged in cleaning the yard. There were 36 shower baths, 24 being for men and the remainder for women. Five fire hydrants were located in the yard and a 25-gallon chemical fire extinguisher was also available in addition to small ones in the coaches.

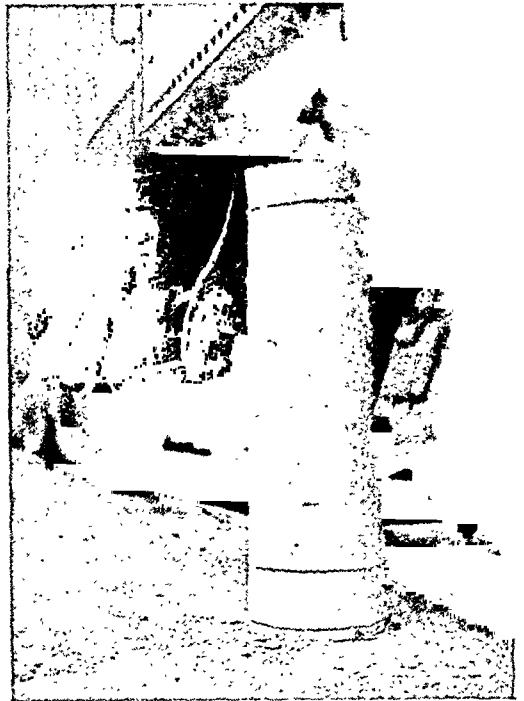
There were 3,000 sanitary cans provided to supply the two Canadian National Railway yards and 2,400 pipe connections for these cans were also available.

#### TEMPLE PARK AND TEMPLE PARK ANNEX ARRANGEMENTS

Equipment for supplying water and ice was apparently quite adequate with the exception of rubber gloves for the men and metal protectors for the water hose when not in use.

The supply of sanitary cans was ample but during the early stages of the convention some difficulty was encountered in making satisfactory connections between the cans and toilet outlets. This was due to many of the outlets leaving the cars on a slope. By using tinsmith's snips and, in some cases, pipe elbows, this difficulty could usually be overcome. In a few cases where toilets discharged directly over wheels and

trucks, it was quite impossible to provide satisfactory means of collection. Constant supervision was necessary to discover toilets which had not been supplied with cans. In many cases the outlets were very difficult to locate, but,



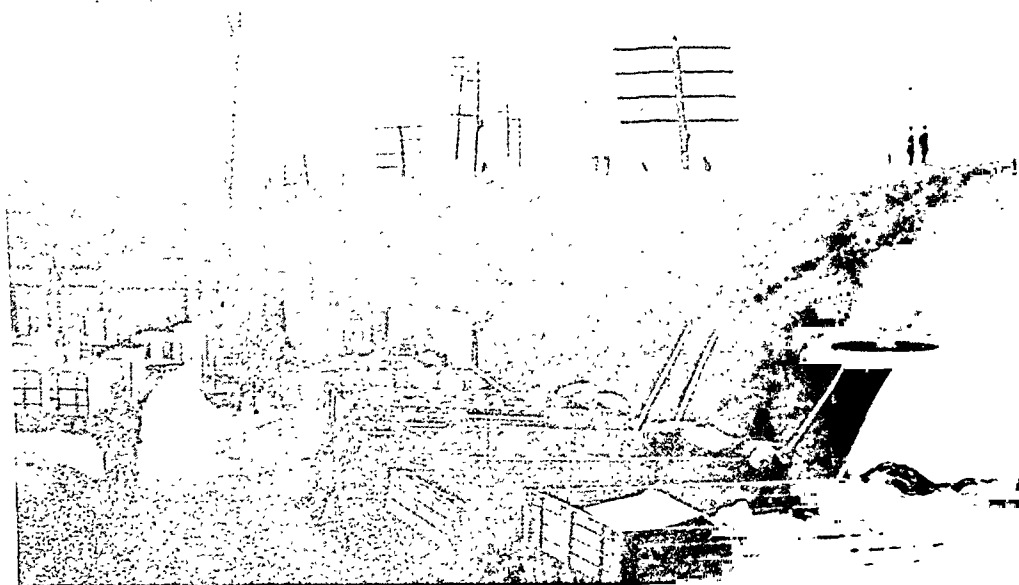
*Sanitary Can in Position, "Fez City"  
(C. P. R.)*

after once being used, it was easy to find them and provide cans.

Owing to the heavy discharge of liquids from dining cars these were a continual source of trouble, and larger collection vessels were found very useful. A plentiful supply of dry sand and gravel was also of considerable assistance.

Disinfectant was used freely around the disposal shed, on the trucks, and in a few cases around the coaches. At no time during the convention was any objectionable odor noticeable in the yards, nor were any flies seen.

On June 10, a heavy rain caused some difficulty due to the increased use of toilet facilities and unpleasant working conditions. During the remainder of



*Sewage and Garbage Disposal Yard, "Fez City" (C. P. R.)*

the convention the weather was fair and moderately cool and no trouble was encountered in keeping everything in a satisfactory condition.

As soon as the coaches were removed, the yard was cleared of rubbish, garbage, and cans, and the tracks were sprayed with disinfectant.

**"FEZ CITY" COACH YARD, CANADIAN  
PACIFIC RAILWAY**

This yard, located at the south end of Bathurst Street, was constructed expressly for the parking of coaches used as living quarters during the convention, and is to be torn up when no longer needed.



*Another View of Sewage Disposal Yard "Fez City" (C. P. R.)*

Hydrants, connected to the city water supply, were located at regular intervals throughout the yard, and steam hose couplings were used on the hydrants and filling hose for ease in coupling them. The filling end of the hose was not provided with any attachment, nor was it protected in any way when not in use.

Ice was stored at the side of the yard in a refrigerator car and, when required for use, was transported to the cars in metal wheelbarrows painted white. Galvanized pails were used to carry broken ice into the cars. The service men were supplied with white uniforms and white rubber gloves.

Garbage and rubbish were collected in open end carbide cans from the yard. From time to time these containers were taken to the disposal yard and emptied into city garbage wagons to be disposed of at the city incinerator.

A special corrugated sheet metal building was constructed and equipped with two compartment showers. The outer compartment was arranged for a dressing room and contained a chair. The walls and doors of the showers were also of sheet metal. Attendants supplied towels and soap, a charge of \$.50 being made for the accommodation provided. Toilets, latrines, wash basins, and a barber shop were also located in this building. The section reserved for women was equipped with toilets, wash basins, showers and a sitting room.

To provide toilet and bath facilities for porters employed on the cars, an old box car was removed from its trucks, reconditioned and fitted with similar conveniences, the effluent from the baths and toilets being discharged into a city sewer.

Sewage disposal cans, 11" in diameter and about 35" long, were specially constructed for the collection of sewage from the cars. A 6" ring of galvanized metal, the same as used in the cans, fitted into the top of the cans, and a heavily oiled cloth was fastened to the

inside of this ring. This cloth was wired around the toilet and waste pipe outlets when the can was in place. Handles were also fitted to the cans for ease in handling. On the side of the tracks where no walks were provided, 10" planks were nailed to the ties and provided a level base for the cans. Close fitting metal covers were placed on the cans when transporting them to and from the disposal yards on trucks hauled by a small motor. The contents of the cans were emptied into 50-gal. wooden barrels provided with covers which could be clamped tightly in place. These barrels were then removed by truck and emptied into a city sanitary sewer. The sanitary cans were washed out with water and this water was dumped into a septic tank which overflowed into a city storm sewer. After washing, the cans were disinfected, the covers replaced, and they were ready for use again.

Between alternate rows of coaches, walks were built up of clay and finely crushed rock, enough of the latter being included to provide good drainage. Electric lights were strung on wires supported by wooden poles located in these walks. Two stationary locomotives furnished steam for the coaches and hot water for the showers.

At the entrance to the "city," two large tents were located, one being used as a lunch counter, and the other as an information bureau, telegraph office, and express office. A frame administration building was located on an elevation at the western end of the yard.

There were 328 coaches, including dining cars, located in this yard, requiring extra men.

#### COMMENTS ON "FEZ CITY"

The type of cans used in this yard seemed to be more easily attached to the toilet outlets than were those used by the Canadian National Railways. This was particularly true in the case of sloping outlets, the advantage being the

larger opening provided. In some cases, where outlets extended considerably below the coaches, shorter cans were necessary. The same difficulty with regard to toilets not being provided with cans was encountered in this yard

as in the Canadian National Railways and constant supervision was necessary to locate and remedy the oversight.

No undesirable odors were noticed throughout the yards at any time, and very few flies were seen.

## INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

**Occupational Skin Diseases from the Biological Point of View**—The author has devised a set of routine eczema tests of a number of substances known to cause eczema and has applied them to working men in various trades with very practical results. These conditions are either due to congenital sensitivity or, as is most frequently the case, a sensitivity developed through previous contact. Such contact may not necessarily be directed to the skin but may come from absorption from another place as from the mouth or the gastrointestinal tract, or by intravenous injections. The process is essentially an allergic one, but does not seem to lend itself to the demonstration of specific antibodies.

The author's investigations have suggested the best prophylactic procedure of occupational eczema to consist in routine testing with the various eczema tests, choosing especially the substances with which the worker may come in contact. Any new employee who gives clearly positive reactions should not be employed where the given industrial exposure may occur. Where the harmful substances are known in the industries an attempt should be made to replace them. In the end, only those workers whose skins show a negative reaction to the given eczema tests should be allowed to come in contact with them.

In a practical way, the method used

in a machine shop showed that a certain rust protector was the cause of eczema and with its elimination the eczema ceased.

Where the eczema is caused by a sensitization it should be possible to desensitize the patient and thus avoid a relapse. This was successfully done in the case of eczema due to oatmeal. However, much more work has to be done along this line. There is hardly a manufactured product which cannot cause an eczema, and these are becoming more numerous in our increase of industrialization.—Prof. Bruno Bloch (Zürich), *J. State Med.*, 38, 7: 373–382 (July), 1930.

**What Protects the Skin Against Light?**—The author concludes, as a result of many experiments, that it is the thickness of the horny layers of the epidermis which protects against the effects of ultra-violet light rather than the deposition of pigment which occurs in the deeper layers of the epidermis (stratum Malpighi). Thus, the negro may not be much more protected than the white, at least until a thickening of the horny layer has occurred.

The conjunctiva of the eye is known to be very sensitive to light rays, and it was found in the case of a white rabbit to be 200 times more sensitive than that of its non-pigmented skin.

The marked light protection of the



horny layer depends somewhat upon the dissemination of light through a cloudy medium, but principally upon absorption. The absorption substances which, as building blocks of keratin present, are aromatic aminoacids such as phenylalanine and tyrosin. These absorb the erythema-productive ultra-violet rays just as strongly as quinine. Likewise cystin plays a not unimportant rôle in light absorption.

The function of pigmentation, which occurs in the deeper layers of the epidermis, which is also an excellent ultra-violet filter, is to act as a protector to the underlying connective tissue. Thus, after the raying of a spotted pigment area of skin one finds that under the pigmented spots the connective tissue is quite intact, while under the non-pigmented epidermis there is a great degree of destruction. "The pigment layer is therefore the sunshade for the cutis, just as the horny layer is the sunshade for the epidermis." It is very probable, also, that the pigment absorbs heat rays, thus protecting the body from an undue amount of warmth entering from without, although this still needs exact investigations and confirmation. — G. Miescher, M.D. (Zürich), *J. State Med.*, 38, 7: 387-391 (July), 1930.

**Natural Gas**—The gas bearing sands, so far as is known, have probably always stored natural gas. In 1821, the first gas well in the United States was drilled in Fredonia, N. Y., and three years later, residents were able to use it for illuminating purposes. The first gas well in Pennsylvania was drilled inadvertently in 1840, when salt water was being sought. The boundaries of the great modern fields are in Louisiana, Texas, California, and Oklahoma. Piping to outlying territories began in Pennsylvania about 1880. Now pipelines lead to Northern Alberta, Atlanta, Denver, while two lines are now proposed for Chicago. The dream is that a net-

work of piping will eventually lead natural gas to all populous centers. An important by-product is gasoline.

Something of the growth of the industry can be seen in the statement that in 1906, 885,000 consumers used natural gas; in 1928, the number had increased to 4,366,000, with the prospect of an early addition of more than a million new users through pipelines then under construction.

(There are next discussed the qualities or composition of natural gas, its production, the gasoline plant, carbon black plants, pipeline construction and maintenance.)

In the classification of jobs, all employees are males, and the chief hazards are named. The article ends with a 2-page discussion of potential health-hazards by Carey P. McCord.—*Industry Report*, Retail Credit Company, Atlanta, Ga., V, 6: 67-76 (June), 1930.

**Studies in Natural Illumination in Schoolrooms**—This is Part III of these studies and concerns the effect of clouds on daylight illumination and on daylight ratios. Parts I and II are contained in *Public Health Bulletin*, No. 159.

While many of the ratios and standards determined vary according to the season, the hour of the day, and the extent of cloudiness, a number of important conclusions, some of which we have already agreed to from practical experience, but some quite new ones, are derived from the study made. (Illustrations, tables, charts and appendices accompany.)—A. F. Beal, Physicist. *Pub. Health Bull.*, No. 188, 128 pp., 1929, price 25c. (Supt. of Documents).

**Heating and Ventilating in Schools and Factories**—The Industrial Health Research Board has published the results of a study by Dr. H. M. Vernon and Mr. T. Bedford. The object was to determine how far panel heating and underfloor heating could be

recommended in factories. It was found that panel heating was highly suitable for factories because it maintained an almost uniform temperature at all levels, but data were lacking as to its physiological effects.

Underfloor heating, adopted in a few schools, seems likely to increase the comfort and efficiency of workers by raising the temperature at foot level instead of at head level. A series of experiments showed that the temperature of schools must not be less than 55° F. for efficiency in manual work such as drawing and writing. A system of underfloor heating was considered the best for such schools, the panel system for other schools. Both methods distribute heat more evenly than hot water pipes or radiators. There is evidence that in workrooms where most of the floor is exposed and the machinery is light, underfloor heating would be suitable, especially in drafty rooms with big doors that often open to the air.—*J. A. M. A.* (London Correspondent), 94, 21: 1712 (May 24), 1930.

**Occupational Cancers**—Cancer caused by coal tar and coal tar products with the chemical characteristics of the various coal tars found in the United States, tar distillation and uses of tar and tar products are summarized. The occurrences of skin cancer among tar and pitch workers are summarized in previous studies.

The present investigation has included reports from several large American cities and in particular the analysis of 19 cases of cancer caused by tar, treated in the Memorial Hospital, New York, and in the New York Skin and Cancer Clinic. Another analysis has included Cleveland, where 21 cases have occurred chiefly in a dry-battery manufactory. A summary of statistical results and conclusions is to the effect that the arms and hands are the parts most affected, with the head next, and

the scrotum least. Cancers were caused in 54 per cent by pitch, in 35.1 per cent by tar, and in 5.4 per cent by tar oil. Gas works' tar and pitch were responsible for 70.2 per cent of the cases, while only 5.4 per cent were due to coke oven tar and pitch; hence the latter is proved much less injurious than the former. It is thought that the presence of olefins in gas works' tar is the cause of cancer. The likelihood of cancer is greatly influenced by the slighter susceptibility to skin cancers on the part of negro workers.

The occurrence of skin cancer among oil workers was likewise studied and a review of 21 cases caused by mineral oils is given in the present investigation. Mule spinners' cancer (cancer of the scrotum) has been all but absent among the cotton textile mill-workers of the United States, in contrast to those of Great Britain. The author argues that the mechanical irritation theory of Robertson is therefore negated since the same types of clothing and other physical conditions are the same in both countries. Hence, the difference must be chemical in nature. As an explanation, it is suggested that the effect of sulphuric acid used in the processing of American mineral oils has a destructive effect on the cancer producing substances of the oil. This strong acid treatment removes olefins and other unsaturated hydrocarbons very effectively. (Tables and bibliographies accompany.)—Imre Heller, *J. Indust. Hyg.*, XII, 5: 169–197 (May), 1930.

**Poison Alcohol**—In response to a request from Rep. Grant M. Hudson of Michigan to Surgeon General H. S. Cumming for information regarding the toxic properties of wood alcohol and methanol, the Surgeon General submitted memoranda from Carl Voegtlin, Professor of Pharmacology, Hygienic Laboratory, and a statement by Reid Hunt, Harvard Medical School, the latter re-

printed from *Industrial and Engineering Chemistry*, 17, 7: 763 (July), 1925.

Professor Voegtlin replied, in part, as follows:

It has been well established that synthetic methanol has the same type of toxic action as ordinary wood alcohol. The earlier claims that synthetic methanol is less toxic than wood alcohol have been proved to be false. It is true, however, that certain samples of crude wood alcohol may contain some allyl alcohol, which is more toxic than methanol. Methanol is readily absorbed by the animal system when given by mouth. The poison is also taken up through the lungs when animals or man are exposed to methanol vapor in air. Thus it has been shown by experiments on rats and dogs that the total amount of methanol absorbed through the respiratory tract varied from 0.32 to 0.55 gram per kilogram of body weight. Methanol is slightly more volatile than ethyl alcohol and grain alcohol, and there are several records in medical literature reporting methanol poisoning in painters using paints containing methanol. The danger of poisoning would be especially great when the painters work in poorly ventilated or closed rooms.

There are also records in the scientific literature indicating that the repeated administration of methanol or methanol-containing preparations to the human skin may cause methanol poisoning and blindness.

To sum up, it would seem that the indiscriminate substitution of synthetic methanol for ethyl alcohol in the manufacture of paints, varnishes, antifreeze solutions, cosmetics, etc., would involve a serious hazard to the health of people. Certain states in the Union have enacted laws prohibiting the use of methanol in all preparations intended for internal administration.—

*Congressional Record*, 71st Congress, Second Session, House of Representatives, Thursday, June 5, 1930.

**Epidemic of Dermatitis Venenata Due to a Hitherto Undescribed Cause**—A very acute watery eruption involving hands and wrists and other parts which may have come in contact with the blood and tissues of certain rabbits, while skinning and dressing them, has been produced in a number of instances in North Carolina. The affliction usually lasts about a week and strongly resembles that due to poison

sumach, but is apparently an entirely new affliction.—F. R. Taylor, *J. A. M. A.*, 94, 24: 1916–1917 (June 14), 1930.

**Industrial Medicine**—It is pointed out that once the needs have been recognized the peculiar and extensive qualifications necessary to become an industrial physician will be readily solved in the matter of preparation and training. Nowhere, at present, can persons combining all of the qualifications be found, so that it is necessary to take likely candidates and to develop these qualities by a suitable course of training (the various qualities are enumerated).—*J. A. M. A.* (Belgium Correspondent), 94, 24: 1934 (June 14), 1930.

**A German Film on Atmospheric Hygiene**—A film, prepared with the cooperation of experts, among whom was Professor Koelsch of Munich, consists of four parts dealing respectively with atmospheric pollutions, injuries to health caused by dust, the history of the campaign against dust, and the gravimetric and optical processes of the quantitative analysis of dust. The producers have announced that a second film on the same subject is at present in preparation.—*Ind. & Labour Inf.*, Internat'l Labor Office, XXXIII, 12: 426 (Mar. 24), 1930.

**Compensation Act to be Extended to Asbestosis**—While the fibrosis associated with silicosis is in more or less isolated nodules, asbestos fibrosis is a fine cobweb ultimately permeating the greater portion of the lungs and leaving little sound tissue. A special scheme of medical inspection by experts will be set up to cover this feature. The disease hardly becomes definite before 5 years' work in the industry, and if it is detected early and the man removed from it, compensation will not be necessary.—*London Letter, J. A. M. A.*, 94, 26: 2078 (June 28), 1930.

**Industrial Diseases and Compensation**—This paper by Dr. May R. Mayers of the New York Department of Labor is too comprehensive for abstracting with justice in the space available and yet it contains so much of value that those who are interested should read it in its entirety.

The discussion upon this paper occupies 18 printed pages of the *Bulletin* and involves the number of occupational diseases reported and features of associated interest as the representative of each state and province was called upon (a number of tables are included representing such reports).

Of particular interest are the discussions regarding the costs of compensating all occupational diseases, from which it is deduced by Mr. Wilcox, Chairman of the Wisconsin Industrial Commission, based on their experience there for some years, that the costs are not over 2 per cent and, in fact, are more nearly 1 per cent of the total costs for all expenditures for accidents. A strong plea was also made by some of the discussants for complete coverage compensation laws for occupational diseases, and the doing away with schedules in which only certain occupational diseases are listed.—*Proc. 16th Ann. Meeting, Internat'l Assn. Industrial Accident Boards and*

*Commissions*, U. S. Bureau of Labor Statistics, *Bulletin 511*: 47-74 (Apr.), 1930.

**Occupation and Health**—Recent brochures in this "Encyclopedia of Hygiene, Pathology and Social Welfare, Studied from the Point of View of Labour, Industry, and Trades" have included the following:

- No. 189: Glass Industry
- " 190: Graphite
- " 191: Hides and Skins
- " 192: Iron, Pig Iron, and Steel Industries  
Iron Carbonyl
- " 193: Ice-Cream Makers
- " 194: Lignite
- " 195: Dyeing
- " 196: Effort (Strain)
- " 197: Electrical Apparatus
- " 198: Electroplating  
Emetine  
Enamels, Enamelling
- " 199: Ethylene and its Derivatives
- " 200: Forges, Ironworks
- " 201: Horsehair, Bristles, and Hair
- " 202: Glove Manufacture
- " 203: Dock Labourers
- " 204: Dusts, Fumes, and Smoke
- " 205: Dyes

In Brochure No. 199, the articles for the *Encyclopedia* have been completed through the letter "E." Price of the complete Brochure Edition is \$16.00. International Labour Office, Geneva, Switzerland, 1930.

# FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

## The Vitamin A Content of the Liver of Normal Hogs and of Hogs Developing Experimental Rickets—

This is a report of experiments planned to study the effect of lack of vitamin D on the storage of vitamin A when the diet was adequate in this vitamin. Since vitamin A has been found in greater abundance in liver than in any other tissues of the animal body livers were chosen.

Pure bred Duroc Jersey fall pigs from 7 different litters were used. They were divided into 2 groups each containing 5 males and 5 females. They were fed on a ration consisting of yellow corn, soy-bean meal, blood meal, dried skim milk and common salt. The control pigs had access to direct sunlight while those in the rachitic group were kept in pens in the barn. All the pigs in the control group survived the experimental period which was 129 days, while 3 of the pigs in the other group died.

The livers from the rachitic group were smaller, darker red, firmer and tougher than the livers from the controls; the rachitic liver showed 69.23 per cent moisture while the normal showed 69.99 per cent.

In this work rats 28 to 30 days of age and weighing from 30 to 40 gm., were used. The ration, consisting of one-third whole milk powder, two-thirds whole wheat, and salt to equal 2 per cent of the weight of the wheat, was irradiated 40 minutes.

The animals were kept on a vitamin-A-free diet until their weights remained stationary for 2 or 3 days. The rats were divided into 2 groups of 24 each, one group receiving 0.1 gm. of normal

liver, and the other 0.1 gm. of rachitic liver.

A table is given showing the weight curves. The rats on the rachitic liver averaged 6.27 gm. per week and those on the control, 4.15 gm. The rachitic hogs consumed approximately 62 per cent more food per lb. of gain and gained less than one-third as much in weight as the control. This points to the possibility that the rachitic animals because of slower growth were able to conserve and store more of the vitamin A supplied in foods.—Rebekah Gibbons and Charlotte B. Barney, *J. Home Econ.*, 22: 491 (June), 1930.

**A Paratyphoid-like Infection Due to Morgan's Bacillus**—In a series of 49 cases, clinically resembling paratyphoid fever, *B. morganii* was isolated from the feces in all the cases, from the blood in 6 cases and from the urine in 11. It was the only significant organism in the feces. Agglutinins for the strain covered from each patient were present in his serum in significant titers (1:40–1:2,560). In 21 of the 22 cases where more than one specimen was obtained, the titer increased during the course of the attack. Agglutination tests with other organisms were invariably negative.

Three strains of Morgan's bacillus tested with 537 serums from normal persons and persons with other diseases agglutinated in 5 instances in a dilution of 1:20. As none of these serums agglutinated any of the strains in higher dilution than 1:20 the high titers observed in our series of cases are apparently the result of a specific reaction.

Examination of the feces of 2,798 healthy adults showed *B. morgani* in only 1.2 per cent. All 44 strains from our clinical cases proved virulent for mice, both on intraperitoneal infection and on feeding.—Leon C. Havens and Catherine R. Mayfield, *J. Prev. Med.*, 4: 179 (May), 1930.

**A Comparative Study of Members of the Lactobacillus Genus, with Special Emphasis on Lactobacilli of Soil and Grain**—Thirty-six strains of lactobacilli representing strains isolated from soil, grain, fecal material, milk products and dental caries are described. The media used and the methods of isolation are detailed. The fermentation reactions of the organisms upon 20 carbohydrates and related substances, their action in milk, broth and gelatin, and their acid production at four incubation temperatures, are listed.

Agglutination reactions and complement fixation tests of the 36 strains with antisera of representative strains are also listed, and results compared with fermentation reactions. Lactobacilli isolated from soil and grain did not as a rule ferment lactose. This marks them as a group distinct from *L. acidophilus*, *L. bulgaricus* and *L. odontolyticus*. Of the lactose non-fermenters, 4 types are more or less definitely indicated on the basis of their fermentation reactions.—George A. Hunt and Leo F. Rettger, *J. Bact.*, 20: 61 (July), 1930.

**The Antiscorbutic Vitamin Content of Some Preserved Foods**—This experiment was conducted to compare the antiscorbutic potency of certain preserved foods with that of the fresh. The foods investigated were canned and fresh grapefruit, packaged dates, canned pimiento, canned cranberry sauce and fresh cranberry. Guinea pigs, weighing 300 to 350 gm., were used as test animals, and the method followed was that of Sherman, La Mer and Campbell (*J.*

*Am. Chem. Soc.*, 44, 165, 1922). The fresh grapefruit was fed as whole fruit and as juice only, and the canned as pulp only, liquor only, and pulp and liquor crushed together.

The protective portion of the canned grapefruit was found to be 2.2 to 2.8 gm. and the fresh 2 gm., while that of canned pimiento was 2 gm. When compared with the values given by Sherman in his *Chemistry of Food and Nutrition*, it is found these foods have vitamin C potency corresponding to that of lemon juice, orange juice, and raw or canned tomatoes.

Definite values for dates, and cranberries were not obtained since the animals refused to eat large enough quantities for a sufficient time, but the results which were obtained indicate that these foods are poor sources of vitamin C, although the raw cranberry is richer than dates and cranberry sauce.—Grace MacLeod and Lela Booher, *J. Home Econ.*, 22: 588 (July), 1930.

**Significance of Colon-Aerogenes Group in Ice Cream. I. Survival of Members of the Escherichia-Aerobacter Group to Pasteurizing Temperatures in Ice Cream**—This paper is a contribution to our knowledge of the proper interpretation of the significance of members of the *Colon-aerogenes* group when found in ice cream. It is pointed out by the authors that difficulties are met with in connection with this product which are not present when applied to milk. Some interesting data have been submitted which may be useful in interpreting the significance of members of this group of bacteria in ice cream.

Comparison was made of the effect on viability produced by heating the different cultures in skimmed milk and in ice cream at various temperatures for 30 minutes. It was indicated that the ice cream exhibited a greater protective action. The phase of the work reported

in this paper deals with the survival of members of the *Escherichia-aerobacter* group to pasteurizing temperatures in ice cream. The protective action of various ingredients of ice cream were compared when subjected to heating experiments.

As a result of their experiments, the authors conclude: (1) The critical temperature for *Escherichia-aerobacter* group in ice cream is about  $65.50^{\circ}\text{C}$ . (2) Ice cream has a greater protective action than skimmed milk for members of the *Escherichia-aerobacter* group when heated at temperatures of  $60^{\circ}\text{C}$ . and  $62.80^{\circ}\text{C}$ . for 30 minutes. (3) Thermal death point determinations made with the cultures in the different ingredients used in making ice cream failed to show any marked protective action of any one of the ingredients. (4) The susceptibility of bacterial cells to heat is greatly influenced by their age. Young cells are more readily killed than the older ones. (5) The ability of many strains of *Escherichia-aerobacter* group to survive a temperature of  $62.80^{\circ}\text{C}$ . and even  $65.50^{\circ}\text{C}$ . in ice cream should be taken into consideration when using the colon test as an index of the efficiency of pasteurization. (6) From the standpoint of the reduction in numbers of the *Escherichia-aerobacter* group pasteurizing the ice cream mix at a temperature of  $65.50^{\circ}\text{C}$ . is more desirable than the lower temperature,  $62.80^{\circ}\text{C}$ ., which is the more commonly used.—F. W. Fabian and E. W. Coulter, *J. Dairy Sci.*, 13: 273 (July), 1930.

**Vitamin-C-Content of Commercially Canned Sauerkraut Together with Some Observations on Its Vitamin A Content**—This investigation was made to determine the vitamin C content of sauerkraut as it reaches the consumer. Six brands of commercial sauerkraut were used in the study of vitamin C. The protective method was

used with guinea pigs as the experimental animals. Levels of  $7\frac{1}{2}$ , 5 and  $2\frac{1}{2}$  gm. were employed.

Considerable variation was found in the 6 brands. The first brand was outstanding because of the good growth and protection it afforded on the  $2\frac{1}{2}$ -gm. level. The second brand, while giving good growth and protection on the  $7\frac{1}{2}$ -gm. and 5-gm. levels, gave evidence of scurvy on the  $2\frac{1}{2}$ -gm. level. The third, fourth and fifth brands gave evidence of scurvy on the 5-gm. level, while in the case of the sixth brand scurvy was evidenced not only on the 5-gm. level but also on the  $7\frac{1}{2}$ -gm. level.

The vitamin C content of the second and third brands compared favorably with that of fermented fresh raw sauerkraut (this JOURNAL, 20: 326, Mar., 1930), but the third, fourth and fifth are distinctly less effective while the sixth contains about one-half as much of vitamin C as found in the raw sauerkraut.

Vitamin A was also studied but it was impossible to arrive at any accurate determination of the possible losses of vitamin A during manufacture and canning of commercial sauerkraut. The amount of vitamin A contributed to the diet by either sauerkraut or winter cabbage is negligible.—Bertha Clow, Helen T. Parsons, Ina Stevenson, *J. Agri. Res.*, 41: 51 (July 1), 1930.

**Nutritive Value of Corned Beef in Rats**—Feeding experiments were made on growing rats, in order to determine the nutritive value of corned beef. The experiments were divided into four groups, as follows:

- Group 1: Corned beef and salt mixture
- Group 2: Corned beef, salt and vitamin
- Group 3: Corned beef, salt and  $\text{CaCO}_3$
- Group 4: Corned beef, salt,  $\text{CaCO}_3$  and vitamin

The experiments lasted 190 days, and

on the 149th day the animals were paired. The animals of all groups developed without any apparent disorders. Special phenomena of avitaminosis were absent in all cases.

According to the growth curves, corned beef alone is a complete food only when supplemented with salt mixture. An addition of calcium is not able to make up the deficit but an addition of vitamins greatly improved the growth of the animals, and seems to insure an undisturbed development of the growing rats.

A propagative experiment was made to determine whether the nourishment of the animals of groups 2 and 4 was

entirely sufficient from every standpoint, notwithstanding the relatively good development of the animals. The experiment showed that additions to the food were still insufficient, and that with but one exception the animals did not propagate, due probably to a quantitative impairment.

It was not possible to obtain a perfect nourishment even by adding mineral substances and vitamins to the corned beef, although the vitamin addition was of great importance in connection with the corned beef nourishment.—Hans Bischoff, *Biochem. Ztschr.*, 222 Band, 1-3 Heft, p. 191 (June 16), 1930.



# PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.\*

## Results of Election at the Biennial Nurses' Convention in June— *American Nurses' Association—*

### *Officers—*

President, Elnora E. Thompson, Portland, Ore.

1st Vice-President, Jane Van DeVrede, Atlanta, Ga.

2d Vice-President, Mabel M. Dunlap, Moline, Ill.

Secretary, Susan C. Francis, Philadelphia, Pa.

Treasurer, Jessie E. Catton, Boston, Mass.

### *Directors—1930-1934—*

Mrs. Genevieve M. Clifford, Syracuse, N. Y.

Adda Eldredge, Madison, Wis.

Major Julia C. Stimson, Washington, D. C.

### *Ex Officio Members of the Board of Directors—*

Elizabeth C. Burgess, New York, N. Y.

Sophie C. Nelson, Boston, Mass.

Clara D. Noyes, Washington, D. C.

## *National League of Nursing Education—*

### *Officers—*

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**Pioneering in Public Health Nursing in Italy—**In 1919 the American Red Cross sent a special commission to Italy to study tuberculosis. Mary S. Gardner, "an authority on public health nursing in the United States," went as chief nurse of the section on public health nursing with 15 graduate nurses who had specialized in public health work to assist her.

Miss Gardner and her nurses had a stupendous task to perform. When the World War began, very few nurses in Italy had a training or status anywhere near that of the American or English nurse. Most of the nursing was conducted by the sisterhoods with the assistance of volunteers—men and women of the servant classes, who did the bedside nursing while the nuns directed the work and assisted some in the operating rooms. High standard schools of nursing were unknown and the hospital authorities did not favor founding any.

When the war came public spirited women in Italy took courses to fit them to care for the wounded soldiers, and these were indiscriminately called Red

\* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

Cross nurses. Their period of instruction required 1 month of hospital work per year, and at the end of 3 years the nurses received diplomas. There were other briefer courses in first aid and care of the sick and wounded. Public health nursing as we know it was unknown. The nuns did some home visiting but nursing care was secondary to spiritual solace and instruction.

The Italian volunteer nurses were devoted to their work, rendered splendid service during the war, and were well organized. At the end of the war this group was pliable and available for reconstruction work along more modern lines in nursing; and "schools adapted to Italian women and Italian needs, specializing in public health nursing, were established by Miss Gardner in Rome, Genoa, and Florence."

The problem was twofold:

1. The creation of a desire for the work, which meant that groups of Italian citizens had to be made conscious of the need for public health work.
2. The creation of a group of workers, which meant that a few carefully selected Italian women must be trained to act as pioneers and teachers.

These courses established in Rome, Genoa and Florence had good committees of public spirited Italian citizens sponsoring them. But there was difficulty finding practical field work for the trainees as most of the doctors would not tolerate "any system of nursing education permitting nurses to visit patients in their homes for follow-up work."

Other attempts had been made before to educate nurses in Italy along the lines of American and British training schools, but the opposition of the medical profession had blocked them.

However, the Italian Red Cross, which before had not recognized the need for a salaried or trained personnel, now decided to start training schools.

In June, 1919, Miss Gardner returned to the United States and Edna M.

Foley, Superintendent of the Chicago Visiting Nurse Association, took her place. "During her term of office the school at Florence was reopened and a second course was completed in Rome and Genoa," and positions were found for the nurse graduates of these courses in other Italian cities.

At the end of 1919 the American Red Cross withdrew from Italy after leaving money with which to carry on the nursing schools established. Well organized Italian committees were left to keep up the work and develop it.

Ten years after there is a very different picture. The work of the two American pioneers in Italy has borne wonderful fruit. There is a flourishing nursing school in Florence directed by an Italian trained nurse who also supervises the twenty visiting nurses in the city, graduates of the school. The public health nurses are called "assistenti sanitarie" and their "work radiates out from dispensaries, from their own offices or from the pharmacies where doctors hold their daily consultations. The nurses cover different districts and are assisted in many ways by committees of local importance which show great interest in their work." It is interesting to know that the fear and distrust of the doctors for these new public health nurses has almost entirely disappeared.

Two things have contributed to the present satisfactory status of public health nursing in Italy and to nursing schools established by the Red Cross:

1. The local committees were so well chosen and instructed in the pioneering period that the spirit of the American nurses lived on in the zeal and devotion of the Italian patronesses who fostered what they had begun.
2. The Fascist party emphasizes maternity care. In 1925 a law was passed requiring all Italian Red Cross volunteer nurses to return to Rome for an extra year of training at the Red Cross school.—

A Public Health Nursing Renaissance, *Red Cross Courier*, IX, 13: 12-14 (July), 1930.

**Public Health Nursing Legislation**—Recognition of public health nursing as a desirable or necessary function of government has only come about in the last 25 years.

Alabama was the first state to sanction the employment of public health nurses by governmental agencies; then New York state made it possible to employ tuberculosis nurses. Ohio, a little later, mentioned nurses in the school health inspection law. In 1911 Massachusetts permitted the employment of visiting nurses and Pennsylvania authorized the employment of school nurses.

The National Tuberculosis Association was one of the first organizations to urge employment of public health nurses.

In 1912 an increased interest began to be felt in visiting nurses and school nurses because of the influence of the newly formed National Organization for Public Health Nursing. Then after the World War the need for rural public health nursing work was recognized and this type of service was emphasized by the American Red Cross.

The Federal Maternity and Infancy Act of 1921 was a potent factor in stimulating interest in state departments of public health nursing. In 1920 there were but 7 state divisions of public health nursing and 11 divisions of child hygiene which were directed by nurses or which employed nurses who had the status of state nursing supervisors. Today there are 9 divisions of public health nursing and 24 divisions of child hygiene, 10 of which are directed by nurses and 14 of which employ nurses to direct the nursing activities of the state.

The establishment of the whole-time county health department has led to the passing of general health laws specifically mentioning the employment of public health nurses.

Now all but 8 states have legislation which pertains to the employment of public health nurses, and some of these have laws sufficiently elastic to provide

for needed personnel in public health work.

Eight states have specific laws defining public health nursing credentials, and 30 states have the nurses' requirements defined by their state health departments. Only 4 states specify that all public health nurses shall meet the requirements of the N. O. P. H. N.

Kentucky and New York are the only states in which the division of public health nursing was created by legislative action.

In public health nursing legislation so far experience has taught two principles:

1. Permissive legislation is usually preferable to mandatory laws.
2. There is an inherent difference in the customs, policies and constitutions of the states in different sections of the country. What is legal in one would be illegal in another.

It is believed that "legislation which delegates general authority to a specific department or agency is preferable to specific regulations in the statutes." The statutes are hard to change and salary and requirement schedules change in a growing profession. California's public health nursing law is considered one of the best examples of good legislation.

The Board of Supervisors of any county may employ one or more public health nurses each of whom shall be a registered nurse, possessing such qualifications as may, at the date of her employment, be prescribed by the State Department of Health. Her compensation and duties are to be determined by the Board of Supervisors.

There is a growing tendency to consider public health nursing as an integral part of a whole well-rounded public health program, not an isolated activity. (The growing interest and membership of public health nurses in the American Public Health Association is an indication of this.) They are feeling their responsibility in promoting every phase of the health program.—Pearl McIver, R.N., *Public Health Nursing Legislation*, *Pub. Health Nursc.*, XXII, 7: 372-376 (July), 1930.

# EDUCATION AND PUBLICITY

E. G. ROUTZAHN \*

Old Dogs and New Tricks—The Extension Service of the U. S. Department of Agriculture furnishes information to farmers and frequently recommends the adoption of new methods.

Even as you and I, the department wondered how effective the "education," once loosed, might be. So 1,646 farmers on the department's mailing list, chosen at random, were followed up. Evidence that the department's recommendations had been adopted was surprisingly encouraging, but even more significant was the discovery that the age of the farmers who changed their minds and methods was apparently not a factor. Here is the tabulation according to age groups of those who adopted the advice.

Age group	Advice adopted
Under 30	76%
31-35	77%
36-40	77%
41-45	79%
46-50	72%
51-55	76%
56-60	71%
Over 61	66%

Farm women were similarly studied. They proved to be less easily influenced to change their household customs than were the men. This was especially noted in the group of women below 31 and above 45 years of age. Why this sex difference? Is it because women

are more conservative or more canny; or because farm men have, as the result of rapid advances in the farming industry, become more responsive to suggestions for change?

Health workers are frequently reminded that seed sown on adult minds falls on stony ground and that the older the mind the more rocky it is likely to be. The mind is, no doubt, most plastic during childhood, but age is apparently not a barrier to learning capacity or willingness to change one's habits—in farming!

The Laboratory Method—Various ingenious attempts have been made to teach health by laboratory methods. Nutrition is one of the few health subjects which lends itself well to experimentation conducted or participated in by the student. In the May, 1930, (Columbia) *Teachers College Record*, Mary Swartz Rose describes the methods devised over a period of 10 years for teaching nutrition in the fifth and sixth grades of elementary schools.

The general principles that should be taught, and why, are admirably discussed, but more interesting is the description of the teaching technic employed. For example: White rats kept in the school are fed on various diets. Daily, the children observe the animals, and soon plead that the ones on the poor diet be changed to the good one "because they look so pitiful." The children note not only the effects of diet but learn also to observe the signs of good

\* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to H. E. Kleinschmidt, Substitute Editor, 370 Seventh Ave., New York, N. Y.  
Mr. Routzahn will resume his contributions to the JOURNAL with the November issue.

health, such as glossiness of fur, clearness of eye, pinkness of nose, and general physical vigor. Similarly, they notice the signs of failing health. The school cafeteria furnishes most pertinent object lessons. Milk is "taken apart" in the classroom. A chicken bone is decalcified in a jar of acid solution and serves to demonstrate visually the rôle of calcium in growth.

The article is pregnant with suggestions for those interested in teaching health by the visual and experimental methods.

**Publicity That Paid**—"Lottie, just past her eighth birthday, was playing house with two little friends. One was the father, one the mother, one the child. Mother at work in the next room heard some talk that sent her into the playroom in horrified, terrified haste."

So began one of Angelo Patri's recent syndicated articles under the caption, "Innocent Children." Parents interested in sex teaching were advised to write to the American Social Hygiene Association for help. Within twenty-four hours, the astonished association was flooded with letters—at this writing they total 3,500. What was the pulling force of this article?—the personality of Patri?—the reputation of the association?—or the simple, intimate account of an experience familiar to every mother? In the May, 1930, *Journal of Social Hygiene*, you will find an interesting editorial which quotes the article, comments on the types of letters received, and explains how the replies were handled.

**The Newspaper Man Tells 'Em**—The *Indianapolis News* published a series of articles written by its special correspondent, Harold C. Freightner, describing the different departments of state government. Seven of the installments informed the people in interesting style what the state board of health is

for and what it does. When a health officer or his assistant talks shop publicly, the listeners are usually few, and the more enthusiastic the talk, the tighter are their fingers crossed. The disinterested observer, "looking in" on the department, has a better hearing. Health leadership is dependent on the appreciation and understanding of the people as to what the health department is driving at. Indiana's achievement is worthy of emulation. The articles are being reprinted in current numbers of the Indiana Health Department's *Monthly Bulletin*.

**Can Doctors Write?**—Is it true that the doctor is incapable of telling the layman health facts interestingly? Health workers frequently complain that it is. In Toledo, O., the local medical society, through its Education Committee, conducts a medical column in the *Toledo Times*. Experience proves that the column is widely read. About 400 of the published essays have been reprinted in book form, called "Three Minute Medicine," under the authorship of Dr. Louis R. Effler, Director of Education. A preface tells the story of this enterprise and discusses the principles of health education as they involve the public, the press, and the doctor.

Brevity and compactness characterize the essays; none of them exceeds 400 words in length. In almost every article, the layman's taste for the spectacular in medicine is capitalized by citing some scientific curiosity. Then he is adroitly led directly to the meat of the essay, which consists almost invariably of a single idea or concept. Who could resist such captions as: "Osler and Chloroform," "Dr. Murphy and the Murphy Button," "Lawsuits in Medicine," "Catgut," "Manana," "The Great Hernia Mystery," "Sword Swallowing and the Esophagoscope," "Contortionists and Dislocationists," "Ven-

triloquism." Technical expressions do creep in here and there, but on the whole the language is simple, pithy, and picturesque, the sentences are short, and the information is scientifically sound.

In a private communication, the author generously authorizes republication of these essays if sponsored by reputable organizations.

**The Health Specialist**—Dr. J. H. J. Upham, eminent internist and medical teacher, believes that the public should be taught to regard the health officer as a specialist of a very important branch of medicine. He was speaking to county and city health commissioners of Ohio at their annual conference at Columbus, May 19, 1930. He believes that the people have a deep-seated confidence in scientific medicine and will accord the health officer the same recognition they give a specialist in any other branch of medicine and pay him accordingly. This attitude will also enlist the sympathetic understanding of the private practitioner; corps spirit will prompt the doctor to support the health department and to explain to patients the necessity of health regulations. It will also, Dr. Upham believes, attract good men into the public health field. Dr. Upham's paper was reprinted by the Ohio Public Health Association, 72 South Fourth Street, Columbus, O.

**A Notable Exhibit**—Practically every one of the 4,400 nurses who attended the biennial nursing convention in Milwaukee, June 9 to 13, visited the Industrial First-Aid Exhibit. It consisted of three compartments; first aid room, office, and rest room. The walls

were finished in spotless white, the floors were covered with linoleum. Not only was the equipment complete in every detail necessary to care for injuries, but there were on display objects and models useful in teaching health practices to employees. The shoe exhibit, for example, illustrated types of footwear suitable for workmen in various occupations. On the shelves were books for employees and nurses. Two nurses were in attendance as demonstrators. Record forms were distributed free to visitors.

This unique display owes its success largely to the genius of Johanna Johnson. It was sponsored and paid for by the Employees' Mutual Life Insurance Company, the Cellucotton Products Company, and other manufacturers who contributed special supplies. The exhibit stimulated considerable interest in the industrial nursing project of the N. O. P. H. N.

**The Lecturer's Man Friday**—The Society for Visual Education announces a new projection apparatus which weighs only 1¾ pounds. This machine is a small stereopticon which uses 35 mm. safety stock film for showing still pictures. It has a capacity of 100 frames or pictures without reloading. It is so compact that it fits easily into the coat pocket. A dozen or more spools of film may be carried in one's other coat pocket if necessary. It projects pictures of a reasonable size in a semi-darkened room. The itinerant lecturer who will not be bothered with undue baggage and accessories will find this a good helper. It is called the S. V. E. Jam Handy Pocket Explainer.

## BOOKS AND REPORTS

**Handbook of Physical Education—**  
*By Ernest G. Schroeder. New York:*  
*Doubleday, Doran, 1929. 323 pp.*  
Price, \$2.00.

The book is divided into two parts. Part I contains ten brief chapters on (1) Objectives, (2) Suggestions for the Instructor, (3) Organizing a Program, (4) Marching, (5) Calisthenics, (6) Games for Outdoors and Indoors, (7) Miscellaneous Activities, (8) Intramural Athletics, (9) Corrective or Medical Gymnastics, and (10) Wrestling. Part II, comprising nearly two-thirds of the total book, is also made up of ten chapters, nine of which are devoted to apparatus work and one to tumbling.

Since this purports to be a handbook of general physical education the reader is likely to be surprised at the disproportionate amount of attention given to formalized activities, such as marching, calisthenics and apparatus work, and the meager treatment given sports and games aside from wrestling. Mr. Schroeder, however, seeks to justify his position by stating on page 127:

A survey of physical education programs in our high schools has revealed that apparatus exercises as a means of physical education is being neglected in our schools. The tendency seems to be to a program limited to sports and games.

Perhaps also the fact that Mr. Schroeder has been director of the gymnasium at the State University of Iowa for 23 years, during which time he has been a leading figure in the advancement of the Western Intercollegiate Gymnastic, Fencing and Wrestling Association may account in part for this conspicuous treatment. These factors superimposed on his earlier experiences as an expert gymnast and wrestler in Ohio Turn-

verein circles present a uniform background with which his philosophy of physical education as here expressed is in full conformity.

A very limited treatment of Intramural Athletics, confined to ten pages, and the chapter on wrestling, featuring the holds commonly used in intercollegiate and interscholastic wrestling contests, are the chief deviations from the formal program. The chapters on apparatus work are especially well done, covering a course of progressive lessons on various pieces of apparatus. The chapter on Parallel Bars, for example, containing 54 graded lessons, illustrated and descriptive of the wide variety of standard combinations commonly used on this piece of apparatus, may be taken as typical of the excellent manner in which Part II is done. The objective character of the volume as a whole would be enhanced by definite reference citations and more extensive and annotated bibliographical material.

The book should be valuable to teachers whose work includes the activities treated and for those who cannot afford specialized books for each. It will also be welcomed by those who, with Mr. Schroeder, believe that the formalized activities are an indispensable part of an all round Physical Education program.

F. W. LUEHRING

**Mental Hygiene—*Special International Congress Number, April, 1930.***  
Price, \$.75.

This issue of a well known journal cannot be passed by without special mention. As the subtitle shows, it was issued on the occasion of the First International Congress on Mental Hygiene recently held in Washington, D. C. If one had not previously realized the im-

portance of mental hygiene, this issue would surely convince him.

It opens with a chapter by the Editor on "Finding a Way in Mental Hygiene," and the other articles are of the usual high quality which characterizes this publication. There follows a section made up of cabinet size photographs of the officers of the national societies taking part in the Congress. More interesting even than this, is the third section, devoted to the pioneers in mental hygiene. Here we have pictures of practically all of the great men of the past, beginning with Pinel, Tuke and Chiarugi. Accompanying each photograph is a short biography. Ninety-one pages are devoted to book reviews, among which are some of unusual interest.

It would be hard to speak too highly of this volume, for so it is, rather than an ordinary issue of a current magazine. We congratulate the Editor, as well as the National Committee for Mental Hygiene.

M. P. RAVENEL

**Fundamentals of Bacteriology**—By Charles Bradfield Morrey. (4th ed. rev.) Philadelphia: Lea and Febiger, 1929. 347 pp. Price, \$3.50.

This is the fourth edition of a textbook of bacteriology intended to be used during the first or introductory quarter's work. It is therefore elementary in nature, and does no more—nor less—than its title promises. The author presumes no previous scientific knowledge on the part of the student, and presents each subject in a clear simple manner. About three-fourths of the book is devoted to morphology, physiology, and methods of study. Where details of technic are not given, as in the discussion of single cell methods, references are cited. The discussion of hydrogen ion concentration is especially good.

The last quarter of the book gives a general survey of pathogenic bacteriology, ending with a brief history of the

science. There are many illustrations showing cultures and apparatus, and five plates of portraits of famous bacteriologists. There is an adequate index.

As an introductory text this seems quite satisfactory. GRACE ELDERING

**Incapacity or Disablement in Its Medical Aspects**—By E. M. Brockbank, M.B.E., M.D., F.R.C.P. London: H. K. Lewis & Co., 1926. 120 pp. Price, \$2.00.

Medical practitioners in examining persons of both sexes for reports upon their fitness for employment in various capacities frequently have to take part in legal proceedings involving statements as to complete or partial disablements. For this it is very useful to have at hand some elementary information on the law of the subject with opinions from medical and surgical authorities on the effects which injury may have in producing various illnesses. The decisions of courts have been consulted in these matters. Discussion of deleterious or dangerous trades, however, has been omitted from the present work.

The book comprises chapters upon the meaning of incapacity, its causes and varieties, the disabled worker's chances of employment, and pension schemes in relation to the employer, the worker, and the insurance companies, with special reference to the National Health Insurance Act.

The main theme of the book is the discussion of the more common causes of incapacity or disablement arranged in alphabetical order for (we have counted them) some 77 afflictions, beginning with Age, Albuminuria, Anemia, Aneurysm, etc., to Thyroid Gland, Tuberculosis, Varicose Veins, and Vertigo. Many cross references are made although the index is brief. We note that, under *mastoid disease*, otitis media is not considered incapacitating for laborious



work, while *pregnancy* in normal women accustomed to hard work may not interfere with manual labor until within a week or so of full time. *Mitral stenosis* incapacitates for laborious work. Good wages ward off *neurasthenia*. Insurance acts should provide for mothers suckling their babies every 3 hours in the interests of the baby.

This well written little volume contains much valuable information in brief form, especially for those interested in prognosis in the afflictions of workers, and is by the author of a previous volume, *Life Insurance in General Practice*.

EMERY R. HAYHURST

**Hygiene for Nurses**—By John Guy and G. J. I. Linklater. New York: Wood, 1930. 212 pp. Price, \$1.75.

This book has been modelled on the syllabus issued by the General Nursing Council of Great Britain. The authors have curtailed the description of the communal aspect of hygiene because they think that hitherto too much stress has been laid on it in the teaching of nurses, and have concentrated on the personal aspect, emphasizing especially the hygiene of the new-born and dietetics.

In the chapter on Communicable Diseases, under Smallpox is a good history and exposition about vaccination, but in describing diphtheria not a word is said about either antitoxin or toxin-antitoxin. This is rather a serious omission. There seems to be a little too much emphasis placed on terminal, and not enough on concurrent, disinfection.

Under Personal Hygiene an unusually interesting and instructive description is given of clothing and cloth materials. The chapters on Food and Metabolism, and Vegetable Foods and Animal Foods are excellent. In the appendix also are helpful tables giving the percentages of foodstuffs in different animal, vegetable, and other foods.

There are a few minor details with

which one might disagree, but on the whole the book is up-to-date and excellent, and can well be recommended as a text or reference book for nurses. It will give them a public health point of view greatly needed today. It has the added attraction of being well printed and easy and pleasant to read.

EVA F. MACDOUGALL

**Rest-Pauses in Industry**—By S. Wyatt, M.Sc., M.Ed. London: H. M. Stationery Office, 1927. 21 pp. Price, \$50.

This is a review of the results obtained by the investigator, S. Wyatt, M.Sc., under the Medical Research Council, in which there are taken into consideration such features as the best position for a rest spell in the midst of the morning and the afternoon work periods—in which it is concluded that the rest pause should be given at the time the output has just reached its maximum. Likewise if a marked decrease in production again occurs a second pause should be introduced where output again begins to decrease. The length of the suggested rest pause should be such as not to cause the loss of swing or incitement, nor more than enough to dispel the factors which have been impeding working capacity. The amount of rest necessary for complete recovery, the method of using rest pauses, the relation to the nature of the work, etc., with objective and subjective effects, are briefly discussed.

The effect of a rest is particularly beneficial in repetitive work of a monotonous character, with the influence most marked on work requiring the greater activities, also where natural rhythm is upset. Benefits of rests may even be noticeable before the rest occurs.

However, unscientific methods have too often muddled the findings of rest period studies so that a careful investigation of the work itself and a typical

curve of output should be obtained before rest periods are introduced anywhere. The effects are also more favorable with some workers than others, and one rests better when all others are also resting at the same time.

Variation of activities is not stressed here nor does it seem that the investigator has considered the value of the short-intervalled rest pauses that must constantly occur between individual work efforts, from which it is just conceivable that if these were properly regulated they might be more effective than definite rest periods. The ideal day's work is one in which the worker quits fresh, and not, as Sir Thomas Oliver long ago remarked, "so tired."

EMERY R. HAYHURST

**Proceedings of the Seventh Annual Short School—Texas Association of Sanitarians, Edinburg, Texas, December 3-5, 1929.** 107 pp. Price, \$1.00.

This seventh proceedings has in it the usual number of short articles on various phases of sanitation. Health education, publicity and administration; garbage incineration; swimming pool and beach sanitation; rodent control; an oyster survey; and the relation of aviation to health are included in the first section.

The second part is devoted to milk. Pasteurization is discussed by Putnam in a very good article. Bovine infectious abortion, T. B. testing, dairy waste treatment, dairy barns and milk houses, as well as water supplies and sewage treatment devices therefor are touched upon.

ARTHUR P. MILLER

**Immunity in Infectious Diseases—**  
By A. Besredka. Translation, Herbert Child. Baltimore: Williams & Wilkins, 1930. 364 pp. Price, \$5.00.

However the author may seek to justify the publication of this book, the reviewer can see little if anything to warrant its presentation. It is essentially

a reprint of Besredka's publications without the virtue of having these brought up to date or even commented upon in the light of modern immunology. Approximately half of the book is devoted to a discussion of antivirus and its clinical use, a subject well covered in Besredka's earlier book, *Local Immunization*. There is insufficient new material to pay for the pain of reading 364 pages, rather poorly written, and indifferently translated. The character of the contents, the title, in fact, everything about the work, suggests d'Herelle's book, *Immunity in Natural Infectious Disease*. It is, however, entirely lacking in the charming style, excellent translation and thought compelling contents of that work.

The character of the production is well illustrated by Chapter IV entitled Antistreptococcic Serotherapy. The most recent reference quoted in this chapter is dated 1909 and the concluding statement is this: "All these experiments . . . indicate that henceforth the streptococcus cannot be looked upon as the actual cause of scarlet fever. . . ." While there may be those who share this opinion, their belief is based upon discoveries much more recent than 1909. As science it has little value, as history it is woefully lacking, and since it cannot qualify as good reading material it is difficult indeed to determine its value.

N. W. LARKUM

**Health, Public and Personal—**  
By Ralph E. Blount. Boston: Allyn and Bacon, 1930. 347 pp. Price, \$1.20.

A new edition of this conveniently sized book has appeared. The book is of an elementary character but it was so designed by its author, as in the writing of it he had in mind the fundamental things of public health which a pupil in the higher grades of the elementary schools or in high school ought to know or be taught. The writer shows an up-to-date knowledge of the main facts of

physiology, anatomy and bacteriology, and relates what is said of personal and public health to that knowledge, which is desirable in such a handbook, not only for accuracy of statement, but for student instruction.

The position taken by the writer in regard to what is based on the best knowledge of the day as against the theories of quacks and the pseudo-scientific is one that commends itself to the medical profession and to the trained public health educator; viz., that it is always wise to consult the best medical opinion rather than fly to some fad that may have no scientific or rational basis.

The book is well written, attractively illustrated and is worthy of a place among books listed in the calendar of studies for elementary and secondary schools.

The advice given is generally sound, although some might question, for example, the advisability of telling people when they are wounded to treat the wound with iodine or some other antiseptic. This may be desirable at times but not infrequently the application of antiseptics causes the individual to do nothing more for the wound when something more should be done. Besides, the use of antiseptics may mask the condition if the individual seeks surgical attention.

JAMES W. WALLACE

#### Lehmann's Medical Hand Atlases—

*Determinative Bacteriology, Vol. I: Atlas.* By K. B. Lehmann of Würtzburg, Germany, and R. O. Neumann of Hamburg, Germany. English translation by Robert S. Breed, Geneva, New York. Seventh German edition, 1930. (Second volume to be published September, 1930.) New York: G. E. Stechert (Alfred Hajner), 1930. 71 pp. 64 ill. Price, \$12.50.

This is the seventh edition of the Lehmann Medical Hand Atlas issued originally thirty years ago.

The book is divided into three major sections, Bacteriological Technique, General Diagnosis, and Atlas. These three sections include the best bacteriological information available, as well as a series of fine color plates and drawings.

The section of Bacteriological Technique consists of 83 pages of meaty and concise information, microscopical technique, staining solutions, preparation of stained specimens, media preparation and methods of use, animal investigations, bacteriological examination of air, water and soil, and the most important immunological-biological diagnostic procedures are covered thoroughly. Over 2,000 new citations have been introduced, so that the section is replete with references.

The section on General Diagnosis is an introduction to the methods of determining bacteria from the plates in the *Atlas*. In outline, the method consists of using the appearance of the stained organism under a magnification of 1,000 diameters, the macroscopic appearance of gelatin plate colonies, the appearance of the gelatin colonies under a magnification of 60 diameters, and the appearance of the gelatin stab. An example is included showing in detail how bacteria are identified.

The *Atlas* consists of 64 excellent color plates and drawings to be used in the application of the method of general diagnosis outlined above. The authors have used color plates for such objects as the stab, streak and potato cultures; drawings for colonies on plates and photographs for bacterial smears. With this combination illustrations of splendid accuracy are presented throughout the whole book.

The English translation makes this compendium available to a great number of English reading scientists. The print is fine but easily readable. Except for two plates which are bound in upside down, the book is well put together.

G. D. CUMMINGS

*By Elizabeth Blaine Jenkins, with the  
coöperation of Dr. C.-E. A. Winslow.  
New York: Merrill, 1929. 163 pp.  
Price, \$68.*

Fairy tales may be what the old fashioned "health agent" would call them, with a scornful sniff, but if they succeed even in part in inculcating honest-to-goodness health habits and attitudes in the young (not the sort of imitation most adults have), they will have made a real contribution. It may well be that the success of the public health movement of the future will depend largely upon health habit promotion among the preschool and younger school children; and to reach the youngsters one must talk their language.

**The Baby's First Two Years—By**  
*Richard M. Smith.* Boston: Hough-  
ton Mifflin, 1930. 159 pp. Price,  
\$1.75.

The definite way in which he expresses the details should be especially praised as a new mother wants to know exactly how many diapers and shirts to buy, at what temperature to have the water, exactly how to wash the baby's

1. The absolute necessity of either pasteurization or boiling of milk with preference for boiling
2. Necessity of fitting the formula to the infant; that is, not to feed it by rule of thumb, but only according to the doctor's prescription

LUCILLE LIBERLES.

Ergebnisse der gesamten Tuberkuloseforschung—Herausgegeben von *H. Assmann, Leipzig; H. Beitzke, Graz; H. Braeuning, Hohenkrug-Stettin; St. Engel, Dortmund. G. Thieme Verlag, Leipzig, 1930. Vol. 1, viii + 573 pp., 110 figs. Price, M. 42.00, Bound, M. 45.00.*

The purpose of this new reviewing periodical is to present at such intervals as the growth of the literature warrants critical summaries of the world's literature upon tuberculosis. The papers in this field are widely scattered in medical journals in various languages and in diverse fields. Significant papers in all phases of the subject are to be included. The subject matter in hand will provide for two volumes, the current one and another to be issued shortly. It is the aim to include the ~~current clinical and~~ pathological anatomy, bacteriology, diology, serology, immunobiology, ther-

apy in all its branches, and the legal and social aspects of tuberculosis. The viewpoints of the scientific investigator and the practitioner are presented.

The first volume contains chapters on the early diagnosis of tuberculosis by Dr. Felix Klemperer, early infiltration by Dr. H. Assmann, healing processes and the detection of healing in roentgenograms in pulmonary tuberculosis by Dr. F. Fleischner, protective immunization against tuberculosis by Dr. B. Lange, the allergy problem by Dr. F. Redeker, the biological bases of the most important non-specific blood reactions in tuberculosis by Dr. G. von der Weth, the detection of the tuberculous and the fight against tuberculosis by Dr. H. Braeuning, the social relations of tuberculosis by Dr. F. Ickert, and the localization and roentgenological demonstration of primary tuberculous lesions in the lung by Dr. S. Engel.

The volume has very complete author and subject indexes. C. A. KOROID

**Getting Well and Staying Well. A Book for Tuberculous Patients, Public Health Nurses, and Doctors—By John Potts, M.D., with an Introduction by J. B. McNight, M.D. (2d ed.) St. Louis: Mosby, 1930. 221 pp. Price, \$2.00.**

Dr. Potts has written a book that is so helpful to many and so invaluable to a certain class of patients that a second edition is welcomed. The burden of the book is that early diagnosis is usually followed by successful results. It has become a habit to blame the doctor first consulted, usually the family doctor, for his mistakes in not suspecting and diagnosing pulmonary tuberculosis in its earliest and most curable stages. The author very justly points out that many patients are already in a more or less advanced stage when they first seek medical advice.

In his first chapter, Suspecting Tuberculosis, he emphasizes this and draws

attention to certain symptoms that should cause any person to suspect tuberculosis: ease of fatigue, irritability, fickle appetite, uncertain digestion, pain or soreness in the chest, poor recovery from "something." Such symptoms are especially important between the ages of 18 and 28. He further emphasizes the importance of "feeling tuberculous," which he apparently applies to the indefinite sense of unease or malaise.

There is only one sure solution of the problem: the lay people must know how to suspect the disease in themselves.

It is a great pity that not more of those who are to become tuberculous in the next few years can have an opportunity to read all this. The section on diagnosis will probably be of more aid to the general practitioner than to the patient, but his references to finding out Who's Who in medicine and referring the patient to the state sanatorium for this knowledge is excellent advice.

Doctors can furnish information only to persons who want to learn. If people want to remain ignorant of the subject and run the risk of paying a severe penalty because of their ignorance, it is their privilege to do so.

Why, asks Dr. Potts, if a boy can read a lesson in his school reader about "Frank and the Bear," should he not read about "Frank and the Mosquito"?

The sanatorium is praised, but attention is called to the fact that the majority of all patients must sooner or later undergo home treatment and they and the family must learn what to do, for recovery involves years of curing. The three arch enemies of the patient are the ignorant family, the officious and ignorant friend and the quack, all described in no uncertain language. Attention is called to the necessity of facing disagreeable facts.

Much of the success or failure of a tuberculous person, provided he has had the advantage of an early diagnosis, depends upon whether he will face the facts like a grown person or act like a child.

There is little to criticise in the book. It might be well to call attention to the value of rest after the noon meal for those undergoing treatment as well as for those who have later returned to work. Such rest is particularly important for those past 40.

It is always a question whether it is a wise policy to write a book for both patient and physician but the author has never lost sight of the patient. It would possibly be a trifle fairer to the doctor if it were mentioned that the "tuberculous feeling" can occur in other conditions but in these it rarely,

as the author states, continues so long.

While few states have no state sanatorium, it might, however, be a wise thing to refer patients seeking information in regard to Who's Who in medicine to the National Tuberculosis Association's headquarters in New York. Some would not follow Dr. Potts in omitting taking the temperature at 8 p.m. and the use of practicing diaphragmatic breathing. These criticisms are, of course, of little moment and in no way impair the very considerable value of this book.

LAWRASON BROWN

## BOOKS RECEIVED

- A COMPILATION OF CULTURE MEDIA FOR THE CULTIVATION OF MICROORGANISMS. By Max Levine and H. W. Schoenlein. Baltimore: Williams & Wilkins, 1930. 969 pp. Price, \$15.00.
- DICTIONARY OF BIOLOGICAL EQUIVALENTS. By Ernst Artschwager. Baltimore: Williams & Wilkins, 1930. 239 pp. Price, \$4.50.
- DOCTOR AND PATIENT. By Francis W. Peabody. New York: Macmillan, 1930. 95 pp. Price, \$1.50.
- THE HEALTHY-MINDED CHILD. Edited by Nelson Antrim Crawford and Karl A. Menninger. New York: Coward-McCann, 1930. 198 pp. Price, \$1.75.
- CLINICAL NUTRITION AND FEEDING IN INFANCY AND CHILDHOOD. By I. Newton Kugelmass. Philadelphia: Lippincott, 1930. 345 pp. Price, \$6.00.
- SCHOOL HEALTH PROGRESS AS RECORDED AT THE HEALTH EDUCATION CONFERENCE, SAYVILLE, L. I., JUNE 17-22, 1929. New York: American Child Health Association, 1930. 343 pp. Price, \$1.25.
- THE BUREAU OF HOME ECONOMICS. Its History, Activities and Organization. By Paul V. Betters. Washington: Brookings Institution, 1930. 95 pp. Price, \$1.50.
- HISTORY OF HAITIAN MEDICINE. By Robert P. Parsons. New York: Paul B. Hoeber, 1930. 196 pp. Price, \$2.25.
- A TEXTBOOK OF HYGIENE. By J. R. Currie. New York: Wood, 1930. 844 pp. Price, \$8.50.
- PROCEEDINGS OF THE 1929 ANNUAL CONFERENCE OF THE NATIONAL SOCIETY FOR THE PREVENTION OF BLINDNESS. New York: National Society for the Prevention of Blindness, 1930. 201 pp. Price, \$1.00.
- LABORATORY MANUAL IN COLLEGE PHYSIOLOGY. By Cleveland Pendleton Hickman. New York: Macmillan, 1930. 116 pp. Price, \$1.10.
- PERSONAL AND COMMUNITY HEALTH. (3d ed.) By Clair Elsmere Turner. St. Louis: Mosby, 1930. 443 pp. Price, \$2.75.
- GONOCOCCAL INFECTION IN THE MALE. (2d ed. rev.) By Abr. L. Wolbarst. St. Louis: Mosby, 1930. 297 pp. Price, \$5.50.
- CROSS-SECTIONS OF RURAL HEALTH PROGRESS. By Harry S. Mustard. New York: Commonwealth Fund Division of Publications, 1930. 230 pp. Price, \$1.00.
- A CHAPTER OF CHILD HEALTH. (Clarke County and Athens, Ga.) Report of the Commonwealth Fund Child Health Demonstration. New York: Commonwealth Fund Division of Publications, 1930. 166 pp. Price, \$1.00.
- RECORDING AND REPORTING FOR CHILD GUIDANCE CLINIC. By Mary Augusta Clark. New York: Commonwealth Fund Division of Publications, 1930. 151 pp. Price, \$2.00.
- THE KEY TO RATIONAL DIETETICS. (New ed.) By Otto Carque. Los Angeles: Author, 1930. 152 pp. Price, \$1.00.
- SCIENCE IN THE KITCHEN: The Selection, Care, and Service of Foods. A Series of Eight Radio Talks. Pittsburgh: Mellon Institute of Industrial Research, 1930. 82 pp. Price, \$60.

# HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Rockford, Ill.—This city with a population of 85,600 reports a resident death rate of 8.7, a birth rate of 17.2, and an infant mortality rate of 48.9. The report is attractively illustrated with charts and graphs carefully prepared, together with a few photographs. A classified financial statement indicates an expenditure of \$30,655 by the Health Department during the year.

"Publicity and education of the public is a necessary function of a well organized department of public health." It is noted in the Bureau of Education and Publicity section that 25,190 health pamphlets were distributed, together with 2,600 educational letters and 1,802 birth certificates. There were 205 press articles and 48 lectures recorded, while 132 health posters and 52 charts, maps and graphs were used. It is noteworthy that the health officer devotes 5 pages to the work of the Visiting Nurse Association, a voluntary agency, in order to present a complete picture of nursing service in the community.

Manchester, N. H.—The communicable disease incidence was relatively low during the year. A neighborhood outbreak of diphtheria is discussed and attention is called to the fact that no child who had received toxin-antitoxin previous to the epidemic developed diphtheria, although a few children so immunized were directly exposed. "It is also significant that many parents who in former years had steadfastly refused to have their children treated, not only asked but even demanded immediate treatment."

An infant mortality rate of 93.2 is recorded. Three infant welfare stations report 2,819 babies under supervision during the year, with 14,830

home calls. A birth rate of 16.9 and a death rate of 10.9 are recorded.

Dairies from which milk was shipped into the city were inspected at least once and sometimes many times during the year. It is reported that so many requests for ratings of milk sold by dealers have been received that a schedule has been devised, and if satisfactory, it will be distributed to those who are especially concerned with the care of babies and infants.

New Hampshire—A report of the Tuberculosis Association for the year 1929 shows that the volume of work accomplished has been larger than in any previous year. Seventy-eight clinics were maintained by the association with 298 sessions. There were 5,862 patients under treatment and supervision. This includes 2,780 arrested cases, 680 of which were added this year, and 8,249 physical examinations were given. Besides these clinics 48 school clinics were held when 2,906 children predisposed to tuberculosis were examined and treated. Since 1925, 13,941 possible victims and 400 with symptoms have been examined. Large numbers of undernourished children have been treated and cured. There were 106 children sent to summer camps last year. The association nurses made 21,784 visits.

A campaign for early diagnosis of tuberculosis in children was begun in April. The purpose of the campaign was to instruct the parents and also to teach the children in school. During April 6,500 pamphlets were distributed and \$1,100 was spent for posters. It sponsored health clubs for children, health education of industrial workers, and play writing contests. The associa-

tion provided a 2-page bulletin of information regarding the diagnosis and treatment of tuberculosis for the physicians of the state, prepared and published by the National Tuberculosis Association.

The state appropriated \$60,000 for the 2 sanatoriums for maintenance and additional beds. During 1928 the Association collected \$41,023.75 from Christmas Seals.

**Knoxville**—A creditable report of 81 mimeographed pages, for the year 1929, shows graphically the work of the bureau of health of the Department of Public Welfare of Knoxville. The table of contents is followed by a concise summary of the organization and special features of the work of different divisions. Knoxville is governed by a mayor and city council, which elect a business manager, who in turn appoints five directors of the following departments: Law, Finance, Public Safety, Public Service, and Public Welfare. During 1929 the city appropriated from public funds slightly less than 62 cents per capita for public health protection.

During the past 3 years the bureau has conducted an extensive study of over 27,000 separate premises in the city, and the results have been recorded and filed. The analyses of these data in preliminary form make this report of unusual interest to administrators. The Bureau of Health, the State Department of Public Health and the Department of Hygiene of the University of Tennessee participate in an annual program of training of sanitary inspectors which deserves careful study. During the year nuisance abatements increased 24 per cent over the previous year and 78 per cent over the 1925 experience. Much progress has been made in the extension of sanitary sewers since the ratification of a 2 million dollar bond issue in 1928.

Improvement in the milk supply is noted over the 5-year period of supervision under the Standard Milk Ordinance

of the U. S. Public Health Service. During 1929, 560 dairies supplied this city of 108,700 population with over 12,000 gallons of milk, 61 per cent of which was pasteurized.

The generalized plan of public health nursing was adopted in 1925 when several separate groups were consolidated under the Bureau of Health. School nursing is one of the important items in the program.

**New York Tuberculosis and Health Association**—In 1929, 100,000 people were reached directly with personal service or information on health matters by the New York Tuberculosis and Health Association, and at least 1½ million more were helped through services to clinics and sanatoriums, according to the annual report of the Association.

The health education service of the association during the year arranged 585 lectures (reaching 67,000 people), 232 radio talks and 1,369 motion picture showings, with a total attendance of 648,000. The association helped in the city-wide Health Examination Campaign of the County Medical Societies.

Service was given to the tuberculosis, heart and other clinics of the city. The income and cost of living of families bringing their children to baby welfare clinics were studied; surveys were made of the out-patient departments of several large hospitals. The clinic committee of the association, according to the report, is the only public health organization prepared to give these expert services.

The Research Service of the association constantly analyzes the city's sickness and death records, and in 1929 helped in a study of tuberculosis mortality in negro sections of Harlem; cooperated in several studies with the Welfare Council; joined with the Bellevue-Yorkville Health Demonstration in various studies; took part with the



Committee on Neighborhood Health Development in studying suitable locations for the new Department of Health local health centers. A city-wide survey of the prevalence of venereal disease was directed by the Social Hygiene Committee of the Association.

A study of silicosis and tuberculosis among rock-drillers, blasters and excavators was completed, and the association is actively coöperating in formulating preventive measures. Further studies are planned of the hazards affecting many of the 600,000 industrial workers of the city. Many of these hazards eventually lead to tuberculosis, pneumonia, heart disease, lead poisoning, and other occupational diseases. An Industrial Advisory Committee organized in 1929 assists mercantile, industrial and other establishments in studying their industrial health needs and organizing medical departments.

During 1929, thousands of tuberculosis patients were helped to secure sanatorium or clinic care; children with heart disease were placed in suitable jobs, given vocational scholarships or placed in convalescent homes; mothers and babies were cared for in well baby clinics; thousands of industrial workers and others were helped to secure health examinations; over 5,000 workers and children were given dental care at cost in the demonstration clinics of the association.

**Pennsylvania Tuberculosis Association**—The 1929 year book refers to the society, organized in 1892, as the oldest tuberculosis prevention organization in the world. The second Early Diagnosis campaign was considered one of the most valuable projects of the year. Members of the Outdoor Advertising Association coöperated in posting approximately 700 twenty-four sheet posters in various sections of the state. Railroads placed 10,000 posters in stations, shops and offices; distributed to

employees 40,000 pieces of literature and to railroad physicians 1,000 copies of a leaflet regarding the diagnosis of tuberculosis. The State Department of Labor and Industry distributed 10,000 posters, and the same number of copies of the leaflet "Make Sure." The State Manufacturers Association sent 6,500 posters to its members. Insurance companies coöperated in a somewhat similar manner.

The report contains effective charts, and a description of two tuberculosis studies of programs in the state. The Christmas Seal Sale in Pennsylvania in 1928 resulted in the raising of a total of \$599,813, with a per capita sale of \$6.09 as compared with \$5.93 in 1927.

**Mount McGregor Sanatorium**—The Metropolitan Life Insurance Company maintains a sanatorium at Mount McGregor, N. Y., for the benefit of employees. According to the 15th annual report for 1929, 5,558 patients have been admitted since the opening in November, 1913, of which 2,588 were tuberculous. The average daily census for the year was 260, with a total of 94,900 patient days. Three hundred patients were admitted in 1929, 163 having tuberculosis, all but 2 being pulmonary in type. The percentage of incipient tuberculosis cases on admission was 31, of moderately advanced 45, and far advanced 23, the latter group being somewhat larger than usual. The number of tuberculous patients coming from the field is slightly larger than that from the home office; by far the greatest number of non-tuberculous patients are from the field (79 per cent).

**Maryland**—The 1929 report of the Bureau of Sanitary Engineering of the Maryland Department of Health covers 16 mimeographed pages of interesting public health engineering material. Attention is called to the typhoid death rate which in Maryland, outside of Bal-

timore City, has fallen to approximately one-ninth of what it was in 1910. The rate for the entire state was 4.2; for Baltimore City alone, 3.2; and for Maryland exclusive of Baltimore, 5.2. To maintain this condition, emphasis is given to the necessity of exercising all sanitary control at maximum efficiency.

Progress is noted in efforts to improve the operation of water purification plants and to secure the extension of sewage disposal systems. Sanitary inspections are made of schools, water sheds, swimming pools, and camps. Appropriations of the 1929 Legislature have made possible improvements in water supply and sewerage systems at state institutions. Extensive studies of stream pollution and industrial wastes are recorded, in addition to an oyster survey. Field inspections during the year totalled 2,068, while 6,486 samples were collected, 208 permits were issued, and 92,680 miles were travelled by members of the staff.

#### Miami County and Troy City, O.

—The 1929 report contains graphs and charts to show the organization of the health department and the downward trend of tuberculosis mortality. The 2 nurses in the county traveled over 17,000 miles and made a total of 3,000 home visits. During 1929 the first deaths in 4 years in the county from diphtheria occurred, there being 5 cases with 2 deaths. In 1929, 649 school children were immunized against diphtheria. During the summer, 456 children in the county and 125 others in Troy city attended preschool conferences. The estimated population of the county is 26,699.

Jamaica—The government of Jamaica, in the 1929 report, calls attention to the increasing interest in public health matters as shown by Parochial Boards and by the general public, and attributes much success to the work of

the Bureau of Health Education. A law has recently been passed enabling the government to give financial assistance to public bodies desiring to establish or improve public water supplies. If the plan is approved by the Colonial Office in England, during 1930 the report of the Medical Commission will become effective, providing for the employment of a full-time health officer in each parish; to be selected, paid, and supervised by the Central Board of Health.

The present coöperative health work consists of units for the control of hookworm through sanitation and treatment, health education, school hygiene, school for sanitary inspectors, malaria control, tuberculosis survey and clinic study, and parochial health departments. The work of each of these units is discussed in detail. During the year 1927–1928, there was expended by the Central and Local Boards of Health 83,941 pounds as compared with an expenditure of 45,121 pounds during 1922–1923.

Indiana—The 1929 report of the Division of Infant and Child Hygiene traces the history and activities of the Division since 1922. "When one considers that 77,592 children have had a thorough health examination in Indiana Child Hygiene Conferences and that each child usually has 2 parents, 4 grandparents and many other relatives who are interested, one may safely multiply the number of children by 4 to estimate the number who have received instruction in child care and training, with a child in whom they are interested as an object lesson."

Courses of study have been presented in classes for women, arranged in coöperation with physicians and nurses. Audiences totaling 606,364 have viewed health films and listened to health talks since this work was organized. Over a million pamphlets have been distributed.

# A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

**Physical Defects and Occupation**—Summarizing the findings of a study of adult health as revealed in 100,000 records of health examinations which are reported in detail elsewhere. Interesting graphs, skillfully done.

ANON. Physical Impairments among Ma'es of Different Occupational Classes. *Quarterly Bull. (Milbank Memorial Fund)*, 8, 3: 58 (July), 1930.

**Measles Anti-Sera**—Convalescent serum proved a better prophylactic agent than adult whole blood. But as whole blood is much more readily available and is of value in attenuating measles, it is the most practical method. Immune goat serum (Tunncliffe) failed to protect.

BARENBERG, L. H., *et al.* Measles Prophylaxis. *J. A. M. A.*, 95, 1: 4 (July 5), 1930.

**Diphtheria After-Effects**—The conclusion of this paper, "Diphtheria in childhood appears to be an etiological factor in the development of heart-block in later years," is significant in view of the fact that the former teaching that "diphtheria injures the heart" seemed to be in the process of being successfully exploded.

BUTLER, S., and LEVINE, S. A. Diphtheria as a Cause of Late Heart-Block. *Am. Heart J.*, 5, 5: 592 (June), 1930.

**Schoolroom Ventilation and Health**—Contribution No. 2 of the New York Commission concludes that differences in schoolroom temperature fail to affect the prevalence of respiratory diseases, thus differing from earlier reports. This final report of the 3-year study will be read with interest in view of the rather heated resolutions once

adopted by the A. P. H. A. at its 1925 Annual Meeting.

COLE, R., *et al.* A Study of Ventilation and Respiratory Illness in Syracuse Schools; with an Analysis of Factors Affecting Criteria Used. *Am. J. Hyg.*, 12, 1: 196 (July), 1930.

**More Schoolroom Ventilation**—The engineer's version of the open window-plenum system controversy, presented by an able committee. Health officials will want to hear the other side of the story, whatever their opinions may be.

DUFFIELD, T. J. The Principles of School Ventilation. *Aerologist*, 6, 4: 5 (Apr.), 1930.

**How Do You Sleep?**—Have you had, or have you given advice about sleeping in this or that position? Here is presented a record of the gyrations a normal sleeper goes through in the course of an 8-hour nap. A perfect example of scientific demonstration that demolishes a dozen unscientific theories.

JOHNSON, H. M., *et al.* In What Position Do Healthy People Sleep? *J. A. M. A.*, 91, 26: 2038 (June 28), 1930.

**Seasonal Fluctuations of Infections**—Carefully collected Danish morbidity statistics furnish the author with excellent material for a broad consideration of the causes of seasonal variations of infectious diseases. A paper with which every epidemiologist ought to be familiar.

MADSEN, T. J. M. The Seasonal Variation of Infectious Diseases. *Pub. Health*, 43, 10: 309 (July), 1930.

**Viewing-with-Alarm**—The President of the A. M. A. portrays the dark side of German and English state medical service, couples the Sheppard-

Towner with the Volstead Act and labels them "paternalistic monstrosities" and finally wonders "what proportion of the appalling increase in the number of mental patients in our country at the present time may be traced to too much paternalism applied through the various correlated mental hygiene agencies."

MORGAN, W. G. The Medical Profession and the Paternalistic Tendencies of the Times. *J. A. M. A.*, 94, 26: 2035 (June 28), 1930.

**Early Diagnosis of Whooping Cough**—The cough plate method for early diagnosis of pertussis is discussed. A potato agar is the medium.

SAUER, L. W., and HAMBRECHT, L. Whooping Cough. *J. A. M. A.*, 95, 4: 263 (July 26), 1930.

**Teaching Nutrition**—A résumé of the work of Detroit Health Department's Nutrition Division, and a plan for the future. An important project, interestingly summarized.

SIMPSON, D. S. Activities of the Nutrition Division. *City Health (Detroit)*, 16, 4: 3 (May and June), 1930.

**Air Conditioning in Hospitals**—Four years' experience in the air conditioning of nurseries for premature infants resulted in a lowering of the diarrhea incidence and mortality rates.

YAGLOU, C. P., *et al.* Application of Air Conditioning to Premature Nurseries in Hospitals. *Am. Soc. Heat. & Vent. Eng. J.*, 2, 7: 605 (July), 1930.

**Maternal Mortality Causes**—Half the women dying in childbirth in Michi-

gan never consulted a physician until just prior to death. Other preventable causes of maternal death are recorded, and the preventive measures are considered.

SMITH, L. R. Maternal Mortality. *Public Health (Mich. Dept. of Health)*, 13, 7: 148 (July), 1930.

**Mississippi's Rural Health Work**—Health problems are local and require local machinery, promoted and assisted by the state, to insure adequate health protection. These are, in essence, the conclusions from Mississippi's experience in rural health administration.

UNDERWOOD, F. J., and APPLEWHITE, C. C. Whole Time County Health Work in Mississippi. *Southern M. J.*, 23, 6: 505 (June), 1930.

**Tuberculosis Case Finding**—This report of the sixth year of work of the Chadwick Clinics (Mass.) deals with the problem of the incipient and pre-tuberculous case after he is found.

WAKEFIELD, P. Children's Tuberculosis Program in Massachusetts. *New Eng. J. Med.*, 203, 4: 168 (July 24), 1930.

**Whither Propaganda**—The mental hygienist and the cancer prevention propagandist come in for some sound berating. Some of the metaphors are mixed and the style is perhaps unduly vigorous, but health educators will be benefitted by reading this paper.

WECHSLER, I. S. The Legend of the Prevention of Mental Diseases. *J. A. M. A.*, 95, 1: 24 (July 5), 1930.

## NEWS FROM THE FIELD

### EIGHTH TEXAS SANITARIANS SHORT SCHOOL

UNDER the auspices of the Texas Association of Sanitarians, with the Texas State Department of Health, the City of Amarillo, and the Amarillo Chamber of Commerce, was held the Eighth Sanitarians Short School, August 26-28, with headquarters at the Hotel Herring.

### CAPPER AWARD TO DR. BABCOCK

DR. Stephen Moulton Babcock, emeritus professor of agriculture and chemistry at the University of Wisconsin, the inventor in 1890 of the Babcock milk test which revolutionized the dairy industry, is to receive the Capper award of \$5,000 and a gold medal at the annual meeting of the American Country Life Association, to be held at the University of Wisconsin from October 7 to 10.—*Science*, Aug. 1, 1930.

### RECREATION PARKS

THE National Recreation Association announces, as the result of a study of county parks just published, that the number of counties providing parks has doubled since 1926, 66 counties in 19 states now having reserved a total of 46,564 acres for their people's play and outdoor life. The first county park in America was set aside by Essex County, N. J., in 1895.

Michigan leads with 12 counties making park provision, and California is second with 10.

Preserving for future generations places of unusual scenic and historic interest has been one of the most valuable effects of the movement, according to the study. Without county action, such places would have been utilized for

commercial or residential uses. The transformation of polluted streams, valleys, mosquito infested marshes, and dumping grounds into attractive landscaped areas has had a striking and beneficial effect in many counties.—*County Parks*, National Recreation Association, 315 Fourth Ave., New York, N. Y.

### BOVINE T. B. DECLINES

A STEADY decline in the prevalence of bovine tuberculosis in the United States has taken place in the last few years as a result of the coöperative campaign to eradicate the infection. The average infection among cattle, for the entire country, is now 1.7 per cent, whereas in 1922 it was 4 per cent.

On May 1, 1930, there were 946 counties officially designated as "modified accredited areas," also 42 towns in Vermont, indicating that these areas are practically free from bovine tuberculosis.

### UNIVERSITY OF SOUTHERN CALIFORNIA

THE new Physical Education Building of the University of Southern California will be ready for use during the 1930 fall semester, which opens on September 15, according to Professor William Ralph LaPorte, chairman of the department of physical education. The structure covers a half-block, and includes many unique features.

### RESEARCH FELLOWSHIPS

THE National Tuberculosis Association announces the appointment of three research fellows for the academic year 1930-1931. The successful candidates were selected from a large number applying from all parts of the country

The three to whom the awards were made are: Alvin E. Belden, M.D., Lancaster, Pa.; William F. Lawrence, Portsmouth, Va.; and Edna E. Nicholson, A.B., Ann Arbor, Mich.

#### COFFEE SELDOM FOUND TO VIOLATE FOOD LAW

**D**OES your breakfast coffee have a smooth rich flavor with just a slight sharpness to give it refreshing zest?

It should have, and most of the 1,400,000,000 pounds imported annually into the United States do have, says the U. S. Department of Agriculture. Inspectors of the Food and Drug Administration seldom find coffee to be in violation of the pure food law. Adulterated coffee is immediately seized to prevent sale to a public which wants and has a right to expect its coffee to be pure.

#### PINK BOLLWORM STOPPED

**S**EVERAL pink bollworms stowed away in a small package of cottonseed sent by mail from India met a timely death recently when the package was examined by a United States plant quarantine inspector at Atlanta, Ga. The inspector immediately ordered the contraband package burned, thus preventing a potential invasion by this pest. The pink bollworm is a destructive pest of cotton, regarded by entomologists as at least in the same class with the boll weevil.

#### DICK PATENT HELD VALID BY FEDERAL COURT

**I**N a somewhat lengthy and involved opinion handed down on June 9, 1930, in a case brought by George F. Dick and Gladys Henry Dick against the Lederle Antitoxin Laboratories, the U. S. District Court for the Southern District of New York held that the Dick patent on scarlet fever toxin and anti-

toxin and the processes for their manufacture granted in 1925 is valid and had been infringed by the defendant. A perpetual injunction enjoining the Lederle Antitoxin Laboratories from using the process or selling the product was issued, and an accounting of sales already made was ordered.

In deciding this case after five weeks' presentation of evidence, the Court held that the methods described in the patent are an invention and not a mere discovery, that it is useful, that there had been no anticipation of the process by others, that the Dochez patent was different, that the Dick patent had been infringed by the defendant's toxins and antitoxins, and that the claims in the Dick patent must be sustained. "The testimony is overwhelming and convincing," declared the Court, "that until we got the Dick test the world had no way at all to determine susceptibility to scarlet fever with precise certainty and definiteness. . . ."

This decision is not, of course, final, as an appeal can be taken to the Circuit Court of Appeals. If it is not, or if this decision is sustained, the use of a scientific method of universal benefit to humanity remains in the control of these two individuals until the period of the patent expires.

#### SANITARY SUPERVISION OF CANNERIES

**A.** L. SULLIVAN, Chief of the Bureau of Food and Drugs of the Maryland State Department of Health, at the request of a committee of representative canners, has directed the attention of the canners throughout the state to the requirements concerning the industry. He recommends that each canner assign a sufficient number of persons to be responsible for the general sanitation of the plant; to see that the place is cleaned up twice a day; and to supervise the living quarters of the workers.

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### The Training of Health Officers\*

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PREVENTIVE medicine is increasingly dominating the thoughts of not only the medical profession but the general public. National health is truly national wealth and full recognition of this will add to the happiness of the nation. Today, the major diseases of yesterday are and can be dimmed to practical insignificance by modern methods of sanitation and immunization. Protection against such diseases as typhoid, smallpox and diphtheria can be obtained and attained without effort or danger.

Unfortunately, the public health movement does not always go forward smoothly and perhaps sometimes intelligently. Any calamity begets reforms. Health is a positive condition but many times its opportunities are overlooked. To be sure, parsimonious activities are first practised in the health department but thrift in expenditures for health matters must be wisely guided. It is perfectly true that half of the general public is not aware of how the other half lives. Ignorance in accepted health principles is inexcusable; therefore, the responsibility of health departments in communicating knowledge regarding such principles is obvious. This educational procedure must be based on facts, and such facts are usually obtained from painstaking research in universities by philanthropic foundations, health departments, and governmental agencies.

As a result of research, one can now appreciate and evaluate the effect of sunlight and proper ventilation on disease, and last but not least, the effect of food. This type of knowledge is invaluable since

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cities are growing larger; transportation facilities are increasing and sometimes more difficult; and the economies of better living conditions are not so easily understood and handled. The scriptures have well said, "As ye go, teach." Life in America is undoubtedly more pleasant and the passing years have seen it markedly prolonged. A vexing problem, however, exists. Health work is primary and fundamentally attached to medicine in all of its many branches. Therefore, the health officer must receive or obtain the broadest training, and today his is the specialty of medicine most unappreciated by organized medicine itself.

Political machinations and interference with the position of health officers frequently lead to changes in the personnel and sometimes in the whole department when the complexion of the political parties changes. That to be a good health officer one must be a graduate physician is certainly not an infallible rule. Some of our excellent health officers and teachers of public health are not physicians, yet this handicap must be fully admitted when put to actual practice by the necessary contact with medicine. Obviously, the trained medical health officer is of paramount importance, but this fact is not taken into consideration by politicians. The history of such political upheavals, however, should constantly guard us against the appointment of the untrained; for the general public generally suffers from an increased mortality or morbidity disease rate. The politician, thick-skinned, hard-boiled, smooth, suave, or of whatever type, listens only to votes and the active, friendless, efficient and scientific health officer is more of a vote liability than an asset.

Until some permanence of office is assured, either politically or by the intervention of organized medicine, trained health officers will be floaters on the sea of politics and usually jetsam and flotsam of the medical profession. This unfortunate fact probably accounts as no other for the unwillingness of the young physician to seek further training in public health; and the lack of effort in many medical schools to permeate their entire curriculum with the spirit and methods of preventive medicine and public health procedures may account in part, at least, for this abortive and somnolent regard manifested by the medical students today.

#### THE PROBLEM OF THE HEALTH OFFICER

There can be no question that a career in public health does not today offer sufficient attraction, financial or otherwise, to our students or medical practitioners. Perhaps, the passing by Congress of the recent reorganization bill of the U. S. Public Health Service, may



show a trend to better things to be expected elsewhere. Certainly, the need for competent officials is greater than the demand. Three things deter good men: lack of knowledge, inadequacy of compensation, and uncertainty of tenure.

Lack of knowledge as to character of work, and the technical and personal qualifications necessary is bound to react unfavorably on the service performed. The curriculum of schools, medical or otherwise, that give public health courses should be presided over or guided by an experienced and successful health official. Only such an individual is capable of pointing out the advantages and disadvantages of a public health career when compared with private practice. Too often the teacher has the technical requirements but not the practical touch. The student must have it stressed that tactlessness, arrogance, and political subservience are the main pitfalls, with the inability to achieve results along known and safe lines.

Of extraordinary importance is the endorsement of the medical profession of new work to be attempted and the policy of sound financial economy and expenditure. Whenever physicians become interested in public health work, it will be of benefit to the public and to the profession. This kind of endeavor is not by any means a conspiracy against the profession for they gain more than they give.

Political judgment in putting over work is often regarded as a criterion of the successful administrator. Knowledge of disease conditions at home and abroad must remain in the foreground, for the modern health department must teach by the written and spoken word, by exhibits, pamphlets and other propaganda, in order that the seeds of sanitation be planted in the soil of the larger audience.

Two of the modern weapons of health work are bacteriology and epidemiology. Many of our older and sometimes successful health officials regard them as synonymous. As a matter of fact, Lemology or Lemography, meaning the sum of human knowledge as to pestilence, was known long before the science of bacteriology came into existence. The application of these subjects to problems is many times neglected or mishandled by the ordinary health department. Another problem that is often neglected is that of midwifery. It is no vapid utterance that this not unimportant cause of infant and maternal mortality is usually 40 per cent incompetent and uninformed. Furthermore, the use of knowledge by the health official will combat cults, for they appeal, like medicine of ancient days, to the mysterious, the undoable and the unknowable, while modern medicine appeals to the intelligence.

The health official should realize that public health and hygiene

are not entirely medical problems but have economic, sociologic and psychologic aspects.

There can be no doubt that the efficient full-time official is not adequately compensated. Unfortunately, it must be equally realized that as the years pass such an official may become less able to meet the competition of private practice, and once eliminated, the staging of a comeback is exceedingly difficult. Medical men in part-time health department work often complain that such contacts are harmful in establishing practice and good material hesitates to enter even this field. We lose, therefore, many of our best men who can ill afford to enter the domain of public health. The advent of Civil Service regulations in health departments by no means solves this problem for it may act both ways, protect the incompetent, impede progressive thought and work by smug complacency, and be used as a lethal weapon by politically wrong minded boards of control. Rightfully and judiciously applied it offers great possibilities in continued good service by capable men.

This brings up the uncertainty of tenure of office, which acts as a deterrent to entering public health. Many health officials bear in their subconscious minds the sad and repeated history that satisfactory performance of duties is no criterion, and that for political reasons they may be thrown out of office. The adult American intelligence en masse approaches closely that of the grammar school and apparently is woefully lacking in separating political humbug from party policies. There should not be any political interference in health department work and conversely, no partisan decisions by health officials. Well conducted health work very often constitutes an asset that political parties cannot afford to neglect.

The health official must realize no matter how thorough his training and how broad his knowledge, that he should surround himself with the best of assistants, equally well trained, equally well paid, and equally sharing in the published data. The establishment of advisory councils drawn from universities, medical societies and social agencies, appears to be not only necessary but fundamental. Unfortunately, this measure is often regarded with suspicion by politically minded and narrow visioned health officials. Many wholly untrained persons occupy front line positions in public health in the United States, and the trained must depend on a secured solidarity of public opinion based on the education of the community and the medical profession to the necessity of having trained health workers. The politician is not always unwise and the health officer who cannot be an honest, incorrupt one may prove impractical in the final analysis even to politicians.

## TEACHING OF PUBLIC HEALTH

The teaching of public health is an argumentative point as to methods of procedure. The advocate of initial training in schools of public health followed by some practical field work either in state, county or city departments apparently has the best of the argument at present. Those who advocate practical experience, preliminary to a collegiate course in public health have been frowned upon because of time limits, financial vicissitudes, and the unwillingness of health departments to recognize this valuable asset of offering such training to their qualified men on leaves of absence.

There has also developed the so-called "in-bred" schools in departments themselves in which new and old employees are trained. This type of training is undoubtedly invaluable for new employees as to certain technical procedures within the department, but its limitations are many when compared to collegiate work in good schools of public health. Perhaps, of greatest importance is the possibility of establishing short courses in these or in medical schools by their own and invited staffs for the training of health officials and the review of pertinent subjects.

It is the modern trend of medical schools to provide instruction along lines of preventive medicine especially in vital statistics, laboratory methods, epidemiology, water and sewage, mental, dental and industrial hygiene, public health administration and education. Unfortunately a usually crowded curriculum perforce must restrict this manner of teaching to lectures. It has become recognized, however, that field trips are necessary to round out such a program. Naturally, such a course cannot be given in its entirety by one individual, as it combines collective and selective knowledge possessed by none or few. Furthermore, the existing facilities of the medical school should be coördinated with those of a well organized health department, be it state, county or city, so that didactic work can be combined with practical training to the benefit of all concerned.

At the Annual Meeting of the American Public Health Association in New Orleans in 1919, a committee of 16, of which the writer was a member, was appointed to consider the subject of standardization of public health training. This committee was cognizant of and in cordial agreement with the expressed idea that the tasks of public health administration require a standardized professional training which would adequately prepare for positions in the public health field and that the possession of such training should be indicated by accredited degrees.

In 1919, Yale University held a conference with representatives of

Johns Hopkins, the Massachusetts Institute of Technology, Harvard, New York University, and the University of Pennsylvania. The committee as well as the Yale Conference came to certain conclusions, practically identical. One of the defects stressed of the system then in vogue was that certain institutions gave not only the certificate in public health but even the doctorate of public health for a course of a few weeks, while others required several years. The committee's opinion was that the first degree should be a Certificate in Public Health, or a Master of Science in Public Health, to be granted for 1 or 2 years of postgraduate work along suitable lines, and the highest degree should be Doctor of Public Health to be granted for not less than 2 years of work in academic residence. Students in the latter course must have the Bachelor or Medical degree, or have satisfactorily completed 2 years in an approved medical school which requires 2 years of college or pre-medical work. The Yale Conference, however, unanimously adopted the resolution that the Doctor of Public Health degree should be for graduates of medicine, and normally awarded after 2 years of work under academic direction, of which, 1 year at least be in residence.

The committee's survey showed 21 schools in the United States and Canada that conferred various degrees in public health, 2 of which allotted them in 36 hours and 6 weeks respectively. Ten schools gave both a certificate and a Doctor's degree in public health. The committee of 16 was replaced by one of 5 members, and in a survey reported October, 1923, the schools conferring degrees in public health in the United States and Canada were reduced to 13 in 1922, but increased to 18 in 1923, 19 in 1924, 21 in 1925, 18 in 1926, and 18 in 1927. These graduated or granted degrees to 66 in 1921, 87 in 1922, 92 in 1923, 98 in 1924, 97 in 1925, 104 in 1926, and 98 in 1927. The University of California in these years reported the conferring of 38 degrees, Yale University 58, Johns Hopkins 267, Harvard 81, Massachusetts Institute of Technology 61, Laval University 10, University of Pennsylvania 17, University of Toronto 30, McGill University 9, University of Iowa 6, New York University 8, and various other universities 1 or 2 degrees each.

About this time short courses were made available in 11 universities and 8 state departments of health. Apparently, in universities the consensus of opinion is that the fundamental subjects to be taught are sanitary and diagnostic bacteriology, sanitary chemistry and biology, vital statistics, theoretical and applied hygiene, sanitary law and legislation, epidemiology, preventive medicine, sanitary engineering and public health administration. To increase the students' perspec-

tive, sufficient postgraduate study in a qualified health department seems necessary. The short courses, however, should cover special subjects by specialists in their fields in the various universities; studies in subjects in state, city or county departments of health; and perhaps correspondence courses arranged in coöperation with both the department of health and the university, and demonstrations in the field.

#### DISCUSSION

We rightfully revere Louis Pasteur, the real founder of preventive medicine. The revolutionizing of medicine so ably begun by a chemist, was given great impetus by Tyndall, a physicist, and Robert Koch, a bacteriologist. Bacteriology has in turn, revolutionized our isolation and quarantine procedures particularly as to the recognition of the healthy carrier. There is no doubt that Theobald Smith focused attention on the importance of transmission of disease by insects. Biggs really modernized public health practice in the United States.

Scientific medicine and public health are not yet closed books, but to many health officers thinking is yet a painful process. Problems are constantly coming up and awaiting solution. One of these is that of trained personnel in public health. Health departments may acquire funds and secure legal power, but expert knowledge, enthusiasm and personal and political integrity are needed in order to obtain maximum results. The mediocre and untrained health officer will always be with us. Nevertheless, the most deeply important phase of the matter and of the future is to make serviceable the sympathetic and active efforts of organized medicine.

The full-time health official has no petty position—his duties are not dribbling matters and his remuneration should be adequate. Many universities have foreseen the need of such training and there is no lack of facilities. The recruiting of the medical profession is, however, sadly lacking and most needed. The newer phases of public health must perforce receive the application of medical knowledge to the detection and prevention of disease. Jordan, in 1922, showed that out of 461 students replying to a questionnaire, 358 had never even considered entering public health work. Moreover, the replies indicated prejudice against this type of work.

A questionnaire was recently submitted to the junior and senior classes of the medical school of the University of California, and apparently there has been no change in opinion. For instance, the answer to the question "Do you intend to take up public health as a career?" was unanimously in the negative, and it was invariably stated that politics and insufficient remuneration guided the decision.

In fact, one answer carried this cryptic statement: "The health officer is too frequently a glorified policeman; and the position too thankless and too poorly paid." One redeeming feature of these answers, however, was the obviously inherent desire to assist the health officer in reporting disease and work in harmony with any program for the prevention of disease. Many students confessed to knowing very little of the health organization in their home city, county or state and when they did show some familiarity, it was the hackneyed pious type of phrase—too much politics.

Presumably, the health officers of the Pacific Coast and slope are not sufficiently well acquainted with medical students—at least, at the University of California—to impress them with their objectives or their methods, nor are their instructors quite able to interest them or remedy this condition without active contact with health departments. In this connection, a health department which has one of the best balanced organizations and an unsurpassed record for achievement, research and activity—that of Detroit—makes this interesting assertion:

The health department has several assistants under training at all times and makes a special point of taking young and promising students from such schools as the University of Michigan, Massachusetts Institute of Technology, and Johns Hopkins School of Public Health. There are four such men on our staff at present working for higher degrees in public health. In addition to this, all Bureau and Division heads are well trained men who are continually availing themselves of opportunities to improve themselves in their specialized field. Moreover, we are great believers in well trained executives and have on our staff men of national reputation in communicable disease work, laboratory, tuberculosis, health administration and epidemiology, venereal disease and sanitary engineering. Likewise, this department coöperates in teaching preventive medicine and public health at the one class "A" medical school. All senior students have a course in communicable diseases, tuberculosis, and maternity service at the Herman Kiefer Hospital. Internes have these same services.

Lectures on preventive medicine and field demonstrations are given to third and fourth year medical students by members of the staff of the health department. Senior students are in daily attendance at our venereal disease and tuberculosis clinics where they receive personal instructions. The staff also gives lectures in public health administration at the University of Michigan in Ann Arbor both during the school year and in special summer institutes.

The Department of Health in Chicago, at least in years past, covered the same activities but for 4 class "A" medical schools. The future of such work is naturally problematical, but such a department is wholly fulfilling its obligation to preventive medicine. One may go so far as to build around the medical school an active ideal health department unit with its own personnel where practical experience may be given students, nurses, etc. This type of unit, however, can only

be established when the health department has far-seeing executives who can appreciate the value of such mutual contact.

Of more than passing interest is the fact that hospital nurses should come to graduation with a practical knowledge of bacteriology, epidemiology, and public health. Too often their instructors are technicians or members of the hospital staff years removed from the subject, or staff nurses selected because of their inadaptability for other duties. It is perfectly true that prescribed courses are mentioned in the curriculum for hospital nurses but it is not infrequent that the course in bacteriology, at least, is given without the student obtaining actual laboratory experience. It is likewise true that hospital nurses are not intended to be bacteriologists but their varied duties are such that sterile technic at the bedside and in the operating room is dependent upon existing bacteriologic flora and a workable knowledge of the reasons for possible contamination and the contaminants is necessary. Just as necessary are the fundamentals of the epidemiology and public health measures to be used to combat disease. The nurse is quite frequently the confidant and companion of the patient and the understanding of questions with their proper answers is equally as important as is sympathy and bedside care. Superintendents of hospitals should carefully scrutinize such instruction in order that the graduate nurse will have adequate familiarity with laboratory technic and public health procedures.

It can be generally admitted that practically every disease affecting the human being is susceptible to some measure of control. The health officer of the future must assume the responsibility of guiding the attack on these. Control does not mean the application of police power, the making and passing of new ordinances, or presuming that ordinary quarantine is continuously effective. The medical profession should have intelligent and serious regard for such matters and give their active coöperation. Likewise, the medical school must realize that in the undergraduate curriculum, a place of importance must be given to preventive medicine. The time of placement is of equal importance, and perhaps such teaching should be concentrated on the fourth year. As an offshoot of the year when bacteriology is usually taught (second year), special field problems could be offered with possibly apprentice work in health departments. Moreover, all teachers of medicine should conform their courses with the newer accepted ideas that the duty of the physician is to promote health and prevent disease.

The health officer is perfectly well aware that 30 per cent or more of confinements occur without medical attendance. As a result the

TABLE I

TOTAL NUMBER OF EXPERIMENTS CARRIED OUT USING MILK IN VACUUM  
AND INSULATED VESSELS OF VARIOUS SIZES WITH CONTINUOUS  
GRAPHIC TEMPERATURE RECORDS

	Experiments
$\frac{1}{2}$ pint vacuum bottle	10
1 pint vacuum bottle	22
$1\frac{1}{2}$ pint vacuum bottle	14
1 quart vacuum bottle	32
2 quart insulated bottle	12
1 gallon insulated jug	10

TABLE II

TEMPERATURE RECORDS OBTAINED WITH CERTIFIED MERCURY THERMOMETER AND RECORDING  
THERMOMETER IN SAME 1 QUART VACUUM BOTTLE AT HOURLY PERIODS FOR 13 HOURS. BOTH  
THERMOMETERS REGISTERED  $145^{\circ}$  F. AT BEGINNING OF EXPERIMENT

Hours	1	2	3	4	5	6	7	8	9	10	11	12	13
Mer. Therm. $^{\circ}$ F.	142.5	140.5	138	136.5	134	132	130	137.5	125.5	123	121.5	118.5	117
Rec. Therm. $^{\circ}$ F.	141	138	134.5	131	129	126	124	122	119.5	117.5	115.5	113	111

period there is a certain loss in heat in the conducting system. Table II shows the differences in the readings obtained upon the same vacuum bottle with the use of the continuous recording thermometer and a certified mercury thermometer for 13 hours. Table III indicates the heat retaining properties of 6 vacuum and insulated vessels used. These are the averages obtained from 100 experiments indicated in Table I.

As mentioned, the 2 important factors to determine were the holding time between  $145^{\circ}$  and  $140^{\circ}$  F., and the duration of time between

TABLE III

MILK WAS HEATED TO  $145^{\circ}$  F. IN OPEN VESSEL AND POURED IMMEDIATELY INTO VACUUM BOTTLE  
OF SAME TEMPERATURE. THE TEMPERATURE OF THE CONTENTS OF THE VACUUM VESSEL  
WAS RECORDED AT HOURLY INTERVALS

Hours	Pint			Quart		
	$\frac{1}{2}$	1	$1\frac{1}{2}$	1	2	4
1	117.5	138.5	140.5	141.5	141	137
2	101	133	136	138	137	132
3		128.5	132	135	134	127
4		124	128	132	131	122.5
5		120	124.5	129	129	118.5
6		116.5	121	126.5	127	114.5
7		113	118	124	125	111
8		110	115	122	123	107.5
9		107.5	112	119.5	121.5	103.5
10		104.5	109	117	120	100
11		102	106.5	115	118	97
12				113	117	94
13					115	92
14					114	90
15					112.5	88



# Home Pasteurization of Milk

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THE advantages of pasteurized milk need not be dwelt upon in this JOURNAL. Our purpose is to report experiments upon the use of vacuum and insulated heat retaining bottles to pasteurize milk in small quantities suitable for home use. This is a part of a program of the Illinois State Department of Public Health to reduce infant mortality in communities too small to enjoy the benefits of commercially pasteurized milk.

Illinois has an approximate population of 4 million people living outside of the city of Chicago, at least 70 per cent of which uses raw milk.

A recording thermometer was used for these experiments. The readings were checked with certified mercury thermometers. Water, milk and other fluids were heated to various temperatures and placed in vacuum vessels of various sizes and types, and the heat retaining efficiency of each vessel graphically recorded on a circular ruled paper by a moving writing point, moved by a time clock. The results are presented in tables, calculated from averages from the time and temperature graphs. The temperatures varied from 100° to 200° F. We are only concerned in this article with those temperatures that are of practical use in the pasteurization of milk for human consumption.

Milk was heated in an open vessel to a given temperature, then placed in a vacuum bottle and the heat retaining efficiency of the closed vacuum vessel determined. Such a vessel can act as an incubator under certain conditions. The object of our experiments was to find a vessel of the proper size that would retain the heat of the milk for the longest period before it served as an incubator for its contents.

This part of the problem divided itself into 3 factors: (1) duration of the holding or pasteurization temperature; (2) length of time that the milk would be warm but wholesome; (3) time when the vessel cooled to a degree that would incubate its contents.

When the continuous recording thermometer is used over a long

TABLE V

BACTERIA ADDED TO MILK, HEATED TO TEMPERATURES INDICATED AND PUT IN 1 QUART VACUUM BOTTLE. BACTERIAL COUNTS MADE UPON 1 C.C. SAMPLES AT INTERVALS INDICATED

	No. of Organisms per c.c.	Temp. F. of Milk at Start in Bottle	30 min. Colo- nies	Temp. F.	35 min. Colo- nies	Temp. F.	40 min. Colo- nies	Temp. F.	45 min.
<i>B. Diphtheria</i>	5,000,000	145	0	144					
<i>B. Typhosus</i>	5,000,000	145	0	143.5					
<i>Strep. Epiderm.</i>	4,000,000	143	0	141					
<i>Staph. Albus</i>	9,000,000	144	0	143					
<i>B. Abortus</i>									
<i>Caprine</i>	2,000,000	145	0	143.5					
<i>B. Abortus Cow</i>	3,000,000	145	0	142.5					
<i>B. Abortus</i>									
<i>Porcine</i>	5,000,000	142	400	141	0	141	0	141	0
<i>B. Abortus*</i>	5,000,000	140.5	300	139	40	139	0	139	0
<i>B. Abortus*</i>	5,000,000	141.5	800	140.5	0	140.5	0	140.5	0
<i>B. Abortus*</i>	9,000,000	145	0	144	0	144	0	144	0
<i>B. Abortus*</i>	9,000,000	139	800	138	500	138	0	138	0
<i>B. Abortus*</i>	25,000,000	147.75	2,000	146	200	146	0	145.5	0
<i>B. Abortus*</i>	5,000,000	143	0	142					
<i>B. Abortus*</i>	5,000,000	143	0	142					
<i>B. Abortus*</i>	5,000,000	145	200	144	0	144	0	143.7	0
<i>B. Abortus*</i>	2,000,000	145	0	143.5	0	143.5	0	143	0
<i>B. Abortus*</i>	7,000,000	145	400	144	0	144	0	144	0
<i>B. Abortus*</i>	5,000,000	145	0	144	0	143.6	0	143.4	0
<i>B. Abortus*</i>	5,000,000	145	100	143.4	0	143	0	142.6	0

\* *B. Abortus Porcine.*

Table VI shows that 115° F. is the lowest temperature at which milk can be held in vacuum bottles before bacterial multiplication begins.

We thought it advisable to use some other indicator for temperatures than the mercury thermometer for the home pasteurization, since initial cost and probable breakage would not aid in the widespread use of this procedure. We have developed two indicators that will replace the mercury thermometer and can be used by the mother in the kitchen. Palmitic acid has a melting point of 145° F. Sealed in an ampule it changes from an opaque to a water clear color when 145° F. is reached. Thin glass tubing 11 mm. in diameter has been made into ampules approximately 45 mm. long, into each of which 400 mg. of palmitic acid was placed, then sealed.

An ampule is dropped into the milk in a pan on the stove. During heating the milk is constantly stirred with a clean spoon. When the floating ampule becomes colorless the temperature has reached 145° F. In our experiments the actual temperature of the milk is seldom less than 147°, and at times 149° F. This is because of exposure of part of the ampule to the air and the poor conductivity of the glass.

140° and 115° F. Table IV gives this in condensed form for the 6 vessels used. These results are averages of 100 experiments outlined in Table I.

It will be seen from Tables III and IV that the 1 quart vacuum bottle is a very efficient instrument for pasteurizing milk. The 2 quart vessel is insulated and the cost is out of proportion to its size when compared with the 1 quart vacuum bottle. The  $\frac{1}{2}$  pint and the pint vacuum bottles, and the gallon insulated jug should not be used for home pasteurization for two reasons: (1) the holding time between 145° and 140° F. is too short, and (2) the length of time between 140° and 115° F. is too short for safety.

TABLE IV

LENGTH OF TIME THE MILK WAS SUBJECTED TO PASTEURIZING TEMPERATURES (145° TO 140° F.).  
LENGTH OF TIME THE MILK WAS HELD AT TEMPERATURES BELOW PASTEURIZATION POINT, BUT  
BEFORE BACTERIAL MULTIPLICATION BEGAN

	$\frac{1}{2}$	Pint 1	$1\frac{1}{2}$	1	Quart 2	4
Length of time 145° to 140° F.	8 min.	45 min.	1 hr. 5 min.	$1\frac{1}{2}$ hrs.	1 hr.	35 min.
Length of time 140° to 115° F.	1 hr. 8 min.	5 hrs. 40 min.	6 hrs. 55 min.	$9\frac{1}{2}$ hrs.	12 hrs.	8 hrs. 20 min.

Various bacteria have been added to the milk to test the efficiency of this method of pasteurization. Most of these experiments have been carried out with the quart vacuum bottles. The bacteria were added to 2 quarts of milk, heated to the temperatures indicated, and put into two 1 quart vacuum bottles—1 c.c. samples were removed after 30, 35, 40 and 45 minutes. The results are given in Table V. Each organism was used for 3 experiments and each experiment was run in duplicate; hence, the bacterial counts on each line in Table V represent an average of 6 counts.

We found that the porcine strain of the *B. abortus* was the most resistant of any of the bacteria tested. We have not used the *B. tuberculosis* in these experiments, as there are many observations recorded upon its thermal death point. If the milk is held between 145° and 140° F. for 1 hour there is a wide margin of safety and it will be free of pathogenic bacteria. Table VI is similar to Table V, except that we used the  $\frac{1}{2}$  pint vacuum bottle. Tables III and IV show the short period that the milk will be held at pasteurizing temperatures in this small vessel. This accounts for the inefficiency of the  $\frac{1}{2}$  pint vacuum bottle (Table VI) as compared to the quart bottle (Table V) for pasteurization purposes.

and boil for 10 minutes. Pour water out of pan carefully, leaving the clean stopper in the empty pan.

3. Clean a pan well and pour 1 quart of fresh clean milk into it. Milk should be free from dirt and less than 12 hours from the cow.

4. Drop indicator No. 1 into the milk. Place pan on the heated stove and bring temperature of milk up rather slowly, stirring constantly with a clean spoon.

5. When the indicator No. 1 becomes transparent, the temperature of the milk has reached 145° F. Remove milk from the stove. Take out indicator No. 1 with spoon and put on table.

6. Pour the hot water out of the vacuum bottle.

7. Pour the hot milk into the heated vacuum bottle. Stopper the bottle.

8. Set the vacuum bottle in a warm cupboard in the kitchen and leave it there until the milk is to be used.

9. Do not use this milk until it has stood in the vacuum bottle for at least 1 hour.

10. Use the indicator No. 2 (with glass stem) to determine whether the milk in the vacuum bottle is warmer than 115° F. Hold the end of the glass tube in the hand and put the opaque bulb down into the milk in the vacuum bottle. Hold it in the milk for 2 to 4 minutes. If it is above 115° F. the bulb will clear. If below it will be opaque.

11. If the milk is at a temperature above 115° F., pour out enough to make a feeding. Replace the vacuum bottle and the remainder of the milk in the cupboard.

12. When the milk in the vacuum bottle becomes cooler than 115°, it should be discarded.

The thermal death points recorded in this experiment have been determined by using the vacuum and insulated bottles. Our problem was to determine the thermal death point of bacteria using the method we have suggested for pasteurizing milk in the home.

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## One Murder in Year Norway's 1928 Record

UNITED States cities where the murder rate has shown a tendency to jump in recent years might profit by studying conditions in Norway, according to figures presented recently before the Commons Committee on Capital Punishment, which show that Norway had only one murder in 1928.

And the tendency is decreasing, due to abolition of the penalty of capital punishment, M. Kristian Hannson, secretary of the Norwegian prison commission, told the committee.

Growth of culture, a higher standard of living, and better police organization were given by Mr. Hannson as explaining the decrease in crime.

Punishment for premeditated murder in Norway is from 6 to 20 years. Good conduct men can be released after serving two-thirds of their sentence.

TABLE VI

BACTERIA ADDED TO MILK, HEATED TO TEMPERATURES INDICATED AND PUT IN  $\frac{1}{2}$  PINT VACUUM BOTTLE. BACTERIAL COUNTS MADE UPON 1 C.C. SAMPLES AT INTERVALS INDICATED

Organisms	Control	Bacterial Colonies									
		145° F.	140° F.	135° F.	130° F.	125° F.	120° F.	115° F.	110° F.	105° F.	100° F.
<i>B. Typhosus</i>	5,000,000	0	0	0	0	0	0	0	0	0	0
<i>Brucella-cow</i>	14,000,000	3,300	2,300	1,200	0	0	0	0	0	0	0
<i>Brucella-porcine</i>	4,000,000	2,100	2,000	1,500	100	0	0	0	0	0	0
<i>Brucella-caprine</i>	2,000,000	0	0	0	0	0	0	0	0	0	0
<i>Staph. Albus</i>	80,000,000	6,600	2,600	2,200	0	0	0	0	0	0	0

TABLE VII

BACTERIAL COUNTS OF 1 QUART SAMPLE OF FRESH MILK IMMEDIATELY AFTER HEATING AND POURING IN VACUUM BOTTLE AND AFTER TIME INTERVALS NOTED. TEMPERATURES TAKEN AT TIME BACTERIAL COUNTS ARE INDICATED

Hours	At start	3½	6½	9	12	16	21	25	28
Temperature	146.75° F.	140	135	130	125	120	115	110	108
Colonies	300,000	0	0	0	0	300	1,800	7,000	300,000

Inasmuch as the cream line is of no importance in this method we have considered the added temperature of 2 to 4° above 145° advantageous. The second indicator is menthol. A glass tube  $4\frac{1}{2}$  mm. in diameter, of approximately 8" in length, is blown out at one end into a bulb, into which menthol is placed and the open end of the tube sealed. Menthol changes from an opaque substance to a clear fluid at 108° F. This indicator is for the purpose of determining if the vacuum bottle has become an incubator. When it is suspended in the milk and remains opaque the milk is not to be used for human consumption. If it changes to a clear fluid the milk is still safe for use. The equipment necessary to carry out this method of pasteurization will cost less than \$3.00. We give the detailed instructions as to the technical procedure.

#### EQUIPMENT

1. Pan of more than 1 quart capacity with side lip to facilitate pouring of milk from pan into bottle
2. Vacuum bottle of 1 quart capacity
3. Temperature indicator (No. 1) for pasteurization in sausage shaped glass tube
4. Temperature indicator (No. 2) for cooled milk—a long glass tube with bulb on end

#### PASTEURIZATION TECHNIC

1. Clean out vacuum bottle with hot soap water several times. Rinse well with water about 160° F., fill bottle with this water and let stand.
2. Wash the stopper of the vacuum bottle well, put it in a small pan of water

projects have been developed along the California-Arizona line with a total irrigable area of 867,000 acres, about three-fifths of which is in Imperial Valley with a population of over 60,000, about half of which is rural. The reclamation of this land has not been easily nor cheaply achieved; constant vigilance has been necessary to prevent a repetition of the break in the levees which occurred in 1905 when the river for 18 months flowed into the Salton Sea. Silting has raised the river bed about one foot per year until it now flows confined by levees on a silt ridge 300 feet above the lowest point of the Valley. Overtopping of levees is an annual menace with each year adding to the danger.

The river has been observed and studied since the close of the Civil War, but has been intensively surveyed for the last 10 years. The present plan for regulation by a dam at Black Canyon has a five-fold object: (1) flood control for the lower basin, (2) desilting of the water, (3) conservation for irrigation use, (4) conservation for domestic use, and (5) development of hydro-power. This discussion is concerned primarily with the use of the water for domestic purposes which may be construed to include industrial purposes.

In the lower basin the present users of the water for domestic purposes include the cities of Needles and Yuma, also 11 communities of the Imperial Valley which take their supplies from the irrigation canals. Of the latter, El Centro for purification uses long subsidence and slow sand filters; Calexico has long subsidence, coagulation and rapid sand filtration; while Brawley, Imperial, Holtville, Niland, Calipatria, Heber, Seeley, Dixieland and Westmoreland employ long subsidence only. Chlorination is practised by 6 of the cities.

The metropolitan district around Los Angeles is the important prospective user of the flood water to be conserved by storage behind Boulder Dam. When the construction of its 250-mile Owens River aqueduct was begun 25 years ago, the city of Los Angeles had a population of 160,000 and it was thought that the Owens River supply of 400 second-feet would suffice for two generations and a population of 2,000,000. During the past 15 years, a cycle of subnormal rainfall has been experienced during a period of unprecedented population growth, and far-seeing engineers have been warning the city that it was making an overdraft on its water resources. Realizing that ample water supply was vital for continued growth, Los Angeles filed claim for 1,500 second-feet of Colorado River flood water whenever it should become available, which is estimated to be enough for 7,000,000 people.

Surrounding cities, experiencing a similar rapid increase of population, and realizing the urgent need of an additional water supply,

# Boulder Dam Symposium\*

## The Sanitary Engineering Aspect

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THE Colorado River has been declared to be the largest remaining undeveloped asset possessed by the United States Government within the public domain. Certain it is that the river, if regulated and controlled, would be the source of great wealth and service, while in its present condition it possesses the power of great loss and destruction.

With a length of 1,750 miles and a drainage area of 242,000 square miles in the United States and 2,000 in Mexico, the Colorado ranks as our third largest river. Formed by the junction of the Green from southwestern Wyoming and the Grand from western Colorado, it has its main source in the rain and snow precipitated in the high Rockies. Leaving these altitudes, it flows through a succession of deep canyons receiving appreciable amounts of water from other tributaries, finally reaching the California line. Along the California-Arizona line south the river opens up into a series of narrow valleys of low altitude with arid climate, and eventually empties into the Gulf of California. For centuries the river has been building up a delta across the Gulf with the result that the north end which formerly extended to Indio was long ago cut off.

The flow of the present unregulated river at Yuma is subject to great variations; the annual discharge has varied from 8,000,000 to 26,000,000 acre-feet; and the average at the Black Canyon dam site (commonly called the Boulder Dam) is 16,200,000; variation in seasonal rate of flow is also great, from 1,250 to 200,000 second-feet actually measured and up to 500,000 estimated. Floods are deliberate rather than flashy in character, being due to melting snows, and occur from May to July; minimum flow occurs from September to December.

Use of the river for irrigation development has so far been made without a comprehensive plan for the entire stream. Some half dozen

cent; for year 1927-1928, minimum 0.03 per cent, maximum 2.92 per cent, weighted average 0.63 per cent. The figures for these 3 years show that the suspended matter may average as high as 10,000 p.p.m. with peaks as high as 138,000 p.p.m. It is reported that water in the Imperial canal system reached 26 per cent silt content in September, 1929. On the basis of a weight of 85 lb. per cu. ft. the U. S. Department of Agriculture estimates that the river carries past Grand Canyon an average of 253 million tons per year, or a volume of 137,000 acre-feet, as much as the total excavation removed by Americans from the Panama Canal; of this total some 15,000 acre-feet are deposited in the Imperial canal system, costing the farmers over \$1,000,000 yearly for cleaning ditches and releveling land. The Boulder Dam will provide storage of 26,000,000 acre-feet, allocated as follows: silt storage 7 million, water supply 10 million, flood control 9 million. If no upstream storage is developed in the meantime, this silt storage may be filled in 50 years and the entire reservoir in 200 years.

After the construction of the Boulder Dam a reservoir 90 miles long will be formed and, as soon as the velocity of the water is stilled in the reservoir, sedimentation will become effective. The 11 water systems in the Imperial Valley provide sedimentation periods ranging from 2 to 10 days, and tests of 222 samples by the California Department of Health showed 96.7 per cent average removal of suspended matter. At Calexico 3 to 5 days' storage is provided the year round, but it seems to be insufficient during flood season, possibly due to colloidal material; at Brawley, as a rule 95 per cent of the suspended matter goes down in 2 hours, but at certain times it will not settle in 1 or 2 days. Apparently it may be expected that rather complete clarification may be effected during the long storage behind the Boulder Dam. Therefore if Los Angeles should decide to tap the reservoir for its supply, a well clarified water should be available. If, however, the supply should be obtained by diversion without storage at some point far down the river toward Yuma, clarification would be necessary. Tests indicate that some of the silt carried by spring floods is now deposited in the 100 miles between Black Canyon and Topock. Silt in the lower river will undoubtedly persist for several years after the dam is built as the water picks up this accumulated silt and carries it onward. The Imperial Valley irrigation system will secure relief from its floods of silt as well as its floods of water, and the domestic water supplies will benefit likewise; some silt may be expected for the first few years as picked up below the dam.

The quality of Colorado River water as to chemical content is of interest from the standpoint of use for irrigation, for industries, and



joined Los Angeles in the formation of the Metropolitan Water District. A recent Los Angeles city bond election has provided funds for extension of the Owens River system, but it is felt that the Colorado River is the only source of sufficient magnitude for the future.

The District is now making surveys to determine the most feasible location for the diversion, and the choice seems to lie among four general routes varying from a long gravity line from the reservoir itself to a shorter line from the river below with high pumping lift (around 1,500 feet). We may assume that the probable diversion will be either from the reservoir itself or from the river below, somewhere between Black Canyon and Yuma.

The potability of the Colorado River water for domestic use is the question to be discussed in this paper. In the consideration of the quality of water for domestic uses attention should be given to the physical, chemical, and bacteriological content; some constituents may have significance only from the esthetic, some from the economic and some from the health standpoint.

#### PHYSICAL AND CHEMICAL CONTENT

Physical characteristics of water include its color, taste, odor, and turbidity. There would seem to be little likelihood of Colorado River water being colored, inasmuch as color is primarily due to dissolved organic matter and the drainage area is not characterized by heavy growth of vegetation, fully half being bare or scantily covered with desert shrubs and grasses. Taste and odor, due to growth in the reservoir of certain organic or plant life, particularly algae, cannot be predicted prior to actual storage of the water but seems unlikely and can be combated if necessary by aeration at the entrance to distribution storage, at the consumptive centers. Turbidity is a matter of considerable interest with reference to the Colorado River water, although suspended matter, taste, odor, and color are of only indirect hygienic significance.

The Grand Canyon has been called the greatest natural silt mill in the world, the silt produced being finely pulverized rock. The entire problem of the relation of Imperial Valley to the project may be said to be one of silt; the silt content has sanitary significance in connection with the necessary treatment of the water for domestic use. Tests of silt percentage by weight made by the U. S. Geological Survey at Grand Canyon gave the following results: October 1, 1925, to September 30, 1926, minimum 0.03 per cent, maximum 3.55 per cent, weighted average 0.56 per cent; for the year 1926-1927, minimum 0.04 per cent, maximum 13.81 per cent, weighted average 1.09 per

The chemical constituent of Colorado water about which there has been most controversy is chlorine. The content of common salt for the 3 years already quoted averaged 85 p.p.m. The U. S. Treasury Standard for salt content is 400 p.p.m. Various authorities place the border line where salt can be detected by taste from 200 p.p.m. up to 800 p.p.m., or even more. Collins of the U. S. Geological Survey says that few people can detect less than 600 to 800 p.p.m.; Whipple set the limit at 200 p.p.m.; and Dr. Wilson of Los Angeles at 400 p.p.m. Collins states that water may be considered good if it contains less than 400 p.p.m. salt. Accordingly the weighted average of Colorado water indicates that while the salt content of the present stream flow is considerable, nevertheless it would fall far short of the amount detected by taste.

The matter under controversy is not the present salt content but the probable salt content after the dam is built and the reservoir created. Salt deposits exist in the area to be flooded, especially in the Virgin River basin, and the probable effect of their submergence is a matter upon which geologists and engineers are not in agreement.

In 1922 Prof. Ransome, now of California Institute of Technology, made a preliminary study of the salt deposits for the U. S. Geological Survey and estimated that they might amount of 25,000,000 tons, most of which would be submerged. About 4 months ago he transmitted to the U. S. Geological Survey an extensive report based on a thorough reëxamination. He contends that the rock salt deposits are stratified; were deposited under arid conditions in a closed basin; and are exposed in cliffs varying in quality from pure to more or less silty salt. He contends that buried salt deposits if present are protected from solution by sediment; that the exposed area of deposits is generously estimated at 22 acres; and that the rate of solution after submergence would depend on area of contact, concentration of solution and temperature. In order to arrive at a rough approximation of rate of solution he performed experiments with blocks cut from the deposit which showed a beginning rate in standing water of 15 ft. per year, decreasing with longer periods of time. Assuming circulation of water in contact, no interfering silt blanket and no hastening of the process by porosity—none of which are in accordance with the facts—he determined that 15 ft. solution on 22 acres will increase the salt content of a full reservoir by 21 p.p.m. He considers this improbable and extreme even for the first year, and asserts that deposition of silt from the water and slumping of the overburden on the salt cliffs will seal the deposits and progressively decrease the rate. Other eminent geologists and engineers—the Colorado River Board, the Special Com-

for domestic purposes. The U. S. Geological Survey, since October 1, 1925, has been analyzing daily samples collected at Grand Canyon, Topock, and Yuma. An average weighted on the basis of quantity of flow indicates approximately the quality of the water held in a reservoir which would store all the flow and after the water was thoroughly mixed. Analyses at Topock and Yuma are very similar to those at Grand Canyon. The weighted averages for the years 1925-1926, 1926-1927, and 1927-1928 show comparatively little variation, and the figures quoted below are the straight averages of the weighted averages for these 3 years at Grand Canyon.

The total dissolved solids were found to be 528 p.p.m. and the average load of dissolved material carried by the river has been computed to be 31,370 tons per day. While the U. S. Treasury Standard sets the limit at 1,000 p.p.m., nevertheless the statement is made that "a water of the highest quality should have less than 300 p.p.m. of total solids and water with more than 750 p.p.m. is unsatisfactory for boiler purposes." Hence it must be recognized that the Colorado water is normally higher than desirable in dissolved mineral salts.

The average total hardness was 263 p.p.m.; bicarbonate radical was 161 p.p.m.; and sulphate radical was 208 p.p.m. The U. S. Treasury Standard for the latter is 250 p.p.m. Hence it may be seen that while the permanent hardness of the Colorado water is below the limit set, nevertheless it approaches the limit. No standards have been set by the U. S. Treasury Department for total hardness and opinions differ with regard to the proper adjective to apply to hardness. Probably due to the remarkable development during recent years in the field of water softening, there seems to be a tendency toward more rigid interpretations. In U. S. Geological Survey *Paper 496*, waters with hardness of 200 to 500 p.p.m. are classed as "hard to excessively hard," while Babbitt in his new text calls 230 p.p.m. "excessively hard" and 250 p.p.m. he calls "too hard for use."

There are now 110 cities in the United States furnishing a softened or partially softened supply, among which is Beverley Hills where a well water having a hardness of 200 to 340 p.p.m. is softened to 80 p.p.m. Until recently a reduction by the lime process of softening to 50 to 60 p.p.m. was considered as good as could be secured, but it is now possible to reduce carbonate hardness to 20 p.p.m. The public is realizing the advantages of soft water as well as clear and safe water, and indifference is being replaced by insistence upon soft supplies.

The iron content of the Colorado water averaged 0.23 p.p.m. while the U. S. Treasury Standard is 0.3 p.p.m., beyond which complaints of deposits and staining are to be expected.

regions offers no comparable alternative to the Colorado River as a source of complete supplementary supply.

Possibly for Los Angeles this is a case where "beggars should not be choosers."

#### BACTERIOLOGICAL CONTENT

There remains to be considered the bacteriological content of the water. Few data exist as to the number of bacteria present. The Yuma water supply is taken from the river to be settled and filtered. Results of 13 examinations by the Arizona State Laboratory from 1925 to 1929 showed the raw water averaging 4,070 bacteria per c.c., with extremes of 400 to 19,000; and the settled water averaging 510 per c.c., with extremes of 45 to 2,200; bacterial efficiency of plain sedimentation thus averaged 87 per cent. The sewage of Blythe is treated in Imhoff tanks and on natural sand filters and does not enter the river; the sewage of Needles, after Imhoff tank treatment and chlorination, enters the river some 220 miles above Yuma, and the sewage of Yuma enters the river without treatment below the city and above the headworks of the Imperial Valley canal system. In the case of Yuma the sewage is said to be diluted 30,000 times.

A sanitary survey of Imperial Valley water supplies made by the California Department of Health in 1922 yielded the following results. In monthly examinations at Calipatria, Calexico, El Centro and Niland from 1916 to 1922—211 samples—total bacteria averaged 2,300 per c.c., *B. coli* 2.5 per c.c., bacterial efficiency of sedimentation 98.8 per cent. It was determined that nearly all the contamination settled out in the first 2 days and that the water was probably safe after 5 days. Settling could apparently be relied upon to remove the greatest part of the contamination. The filters at El Centro and Calexico removed some bacteria but reliance could not be placed upon them for substantial protection.

The Imperial Valley canal water appears to be grossly contaminated at all times evidently caused by contamination within the Valley. The Colorado River contamination at Yuma, shown by total bacteria and *B. coli*, must be largely due to drainage from grazing lands since the only sewage is greatly diluted and enters the river a long distance above. There can be no doubt as to the need of filtration and chlorination of all the Imperial Valley public water supplies. Of course, they will benefit by the dam through the reduction in the amount of silt load requiring removal and in the mixing of water during storage resulting in an averaging of chemical content.

The water supply for Los Angeles will be desilted during its long

mittee of Los Angeles Chamber of Commerce, and the Metropolitan Water Board—share and agree with Prof. Ransome's opinions. The Metropolitan Water Board is now conducting detailed surveys and examinations of the locality.

As opposing the majority views may be mentioned E. C. LaRue, Hydraulic Engineer, and C. K. Fox, Consulting Engineer. The former believes that "the amount of salt carried at present is considerable and that any additional amount would be detrimental to agriculture where the water is continuously used for irrigation." The latter contends that the salt deposits were laid down in the bed of an ancient sea; that rock salt deposits exist 100 ft. thick and 30 miles long, that their amount may be as high as 25 billion tons; that the Colorado River and Virgin River gravel beds are salt-bearing and that 5,000 p.p.m. salt in the reservoir water may be the contribution from these sources.

The salinity of the reservoir water seems to be the constituent of most uncertain amount, but most authorities believe that the increase due to salt deposits will be inappreciable. However, any increase cannot be offset by any form of treatment; it has been said that anything can be removed from water except salt and politics!

From the standpoint of chemical content, therefore, the Colorado River water cannot be said to be first class. C. S. Howard in U. S. Geological Survey *Paper 636-A* says:

Clarified Colorado River water is nearly always satisfactory for drinking. It will serve for all ordinary domestic uses but does not attain the standard of quality generally demanded for a modern public water supply. The hardness of the water of the public supplies of Boston, New York, and many other cities is less than one-tenth of the average hardness of the Colorado water.

The Colorado River Board, consisting of five engineers and geologists, reported as follows:

The waters of the Colorado are normally high in dissolved mineral salts, chiefly carbonates, sulphates and chlorides. The amount is well within the limits of accepted practice for irrigation purposes. For domestic use the salt content is high; it is not an ideal water for such purposes but the fact that it is usable is demonstrated by its use in the cities of Imperial Valley and in Yuma and other communities along the lower Colorado.

*Bulletin 17* of the California Department of Public Works. *Co-ordinated Plan of Water Development in Southern California*, contains this statement:

While the mineral content of Colorado River water is greater than would be desired if a choice in supplies were open, the lack of surplus water in the nearby

# The Immigration Aspect

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SOMEWHAT comparable in magnitude to the construction of the Panama Canal, the construction of Boulder Dam, whereby the world's greatest artificial lake will be formed, will be one of the largest engineering feats ever undertaken by the United States Government. We are told by the Department of the Interior that the time required to complete the task will be approximately 8 years, and the number of men employed at all times will be about 1,000. In addition to those actively engaged in construction work the families of employees and others drawn to the Boulder Dam townsite for business purposes will probably total a permanent population of approximately 5,000.

Located within easy reach of two transcontinental highways, one passing through northern Arizona and another through central Nevada, the Boulder Dam, with the widespread publicity given to it, will attract many thousands of tourists and employment seekers who will include it in their itinerary. It may be expected that a minimum of 25,000 to 30,000 people will visit the dam site each year.

At present no developments have been started, and as all lands along both sides of the Colorado River in the vicinity of future construction activities are owned by the federal government, the governmental agencies will be in a unique position as far as the approval of townsite plans, the termination of leases to those who may attempt to conduct non-legitimate business enterprises, etc., are concerned. Unlike conditions met with at similar large construction projects, it should be a comparatively easy matter to weed out the bootlegger, professional prostitutes, professional gamblers and other undesirables who are a detriment, from both a public health and economic standpoint, to the well-being of law abiding communities.

Climatic conditions in southern Nevada are considered to be altogether healthful. With the Boulder Dam, however, as the objective for many thousands of people, representing many nationalities and coming from all parts of this country as well as foreign countries, including Mexico and the Orient, it is certain that immigration problems will be met with which will require careful and continued public health supervision.

While no definite information could be obtained from the Secretary of the Interior as to the different nationalities which will be represented among the employees, I am grateful for information furnished through Dr. R. J. Stroud, Secretary of the Arizona State Department of Health, relative to nationalities employed in the construction of the Roosevelt and Coolidge dams in Arizona. Some information was also obtained from contractors who constructed several of the larger irrigation district and municipally owned dams in California. If the same policy of recruiting local labor is pursued at the Boulder Dam site as was carried out in the construction of smaller though similar projects in the Southwest, it can be expected that the proportions of nationalities represented will be about as follows: Mexicans 50 per cent, Indians 20 per cent, Filipinos not to exceed 2 per cent, and the remaining 28 per cent made up principally of Americans. There will in all probability be a few Chinese and a few Japanese who will be engaged in business enterprises of one kind or another.

Plans have already been drawn for the construction of the Boulder town on a permanent basis, with consideration given to proper ventilation and heating systems for all dormitories and other living quarters. A safe water supply and a sanitary method of sewage disposal have also been provided for, both of which will be built according to the specifications of experienced sanitary engineers.

#### DISEASE CONTROL

To obtain the best results in the prevention and control of disease will require close coöperation on the part of officials in charge of construction operations with federal, local and state public health and police officials. With the probability of many Mexican laborers, few of whom will have been vaccinated, considerable smallpox can be expected and some typhus may be met with. While vaccination cannot be made compulsory under the state laws of Nevada or Arizona except in time of a pending epidemic, a requirement on the part of employers for anti-smallpox vaccination for all non-immune applicants for employment would be a master stroke in the prevention of this disease, and may result in a great economic saving for employer and employee alike. Such a policy is now being carried out by the Southern Pacific Railway Company and has met with little opposition from trainmen and others affected by the ruling.

With the high prevalence and widespread distribution of epidemic cerebrospinal fever in the western states during the past few years it can be expected that some cases may be met with among the Boulder Dam population. Due to their high susceptibility and their tendency

to crowd together in close sleeping and living quarters, meningitis has been particularly prevalent among Filipinos in the Rocky Mountain and Pacific Coast states during the past two years. Should any considerable number of Filipinos be employed or become residents of the Boulder vicinity, careful and constant supervision of sleeping quarters will be necessary to prevent the spread of this disease.

Trachoma is very prevalent among the several tribes of Arizona Indians, many of whom will probably be employed as laborers by the construction companies. While these people will prefer to live in their tepee tent colonies away from other employees, constant vigilance will be necessary to prevent the spread of trachoma among school children. The Indian is also very susceptible to both measles and tuberculosis. For the control of these diseases and the general health of the Indians, as well as for the protection of those with whom the Indians will come in close contact, best results can be obtained through a public health nursing service. It would be preferable if an Indian nurse or one who has had previous experience with Indians could be employed for this duty. Careful sanitary supervision will also be necessary for Indian colonies in order that body excretions may be properly disposed of and the spread of typhoid and other intestinal diseases prevented.

Bacillary dysentery has been particularly prevalent in the Southwest during recent years. Hundreds of cases have been seen in the Salt River Valley in Arizona during the past three years, and it cannot be expected that the Boulder Dam district will completely escape this infection. In addition to the maintenance of a safe municipal water supply for the town and vicinity, careful and continued inspection and supervision of raw food supplies should be carried out. In view of the very hot weather in southern Nevada during the summer months, proper refrigeration facilities are essential and should be required for all food dispensaries.

#### MILK AND DAIRY PRODUCTS

In that neither southern Nevada nor northern Arizona is a milk producing area it is probable that the major portion of milk and milk products used at the Boulder Dam site will be provided from distant points, though some will be supplied from small dairies in the immediate vicinity. It will be necessary, therefore, that provision be made for the inspection and sanitary supervision of all dairies furnishing products to the people of the Boulder district. Unless such provision is made there will be constant danger of epidemics of diarrhea and enteritis, typhoid fever and other milk-borne infections.



Regardless of the degree of vigilance of the police and public health officials there will probably be a considerable venereal disease problem to be met. Although open prostitution may not be permitted, clandestine prostitution will be certain. For effective venereal disease control, continued and close coöperation between police and public health officials will be necessary. For the treatment of venereally infected patients a free treatment clinic should be maintained as a part of the routine program. An anti-venereal disease educational program should be carried on and should include the distribution of information through posters, pamphlets, lectures, the showing of moving picture films, etc. The literature distributed on the subject should be printed in as many languages as necessary.

#### IMMUNIZATION AND VACCINATION

It is probable that compulsory vaccination and immunization cannot be legally enforced in either Nevada or Arizona. If, however, the construction companies can be induced to require all employees to be vaccinated against smallpox and immunized against typhoid fever prior to or immediately after employment the control of these diseases will be greatly simplified and undoubtedly a great economic saving will be accomplished. Both anti-smallpox vaccination and anti-typhoid immunization, without cost for the service, should be offered to and urged upon all residents of the Boulder Dam area. Anti-diphtheria immunization should also be provided without cost for all children of preschool and school age.

Southern California county health officials and state and county health officials of Arizona advise that expenditures for the care of the indigent sick in the Southwest are a very heavy tax upon county and municipal appropriations for health purposes. In many instances funds appropriated for preventive measures are diverted for use in supplying food and medical care for indigents who have contracted preventable diseases, particularly smallpox and typhoid fever, in eastern or central western states or in Mexico, and have become ill while migrating to the Rocky Mountain or Pacific Coast states in search of employment, the restoration of health, or for other purposes. Certainly the indigent tourist is a considerable economic problem of many counties throughout the Southwest and every effort should be made by officials in charge to discourage prolonged visits of itinerants to the Boulder Dam site.

When the necessary personnel has been recruited widespread publicity should be given through the press that additional employees are not needed. Otherwise there will in all probability be a continuous

pilgrimage of wandering citizens headed for Boulder Dam during the period of construction. Most of these people will expect to live in tents by the roadside and at so-called automobile camps. Most of these camps are grossly insanitary, and constitute a serious public health problem. Typhoid fever, smallpox and other communicable diseases may be expected among these people and when they occur little can be done to control their spread.

#### HYGIENIC LABORATORY FACILITIES

The weekly bacteriological analysis of water and milk supplies, the examination for suspected diphtheria and tuberculosis cases, the diagnosis of venereal disease infections, and the routine running of Wassermann or Kahn tests, together with other necessary routine laboratory work, should justify the establishment of a hygienic laboratory at the site of construction. A single laboratory should be able to carry on all necessary work for the two counties adjacent, one in Arizona and one in Nevada.

#### ISOLATION AND HOSPITALIZATION

While hospital facilities are being provided for in the plans for the town which will be constructed for employees and their families, provision should also be made for the isolation and segregation of communicable diseases. An attempt to quarantine or isolate patients suffering with communicable diseases in dormitories, roadside tents or automobile camps, will be unsatisfactory and will constitute a serious health menace to the people of the local community and to those of nearby cities and towns and surrounding states.

#### OFFICIAL SUPERVISION

While the actual construction of the Boulder Dam will be carried on by private companies who will be under contract with the federal government, the dam itself and all the land in the immediate vicinity, including the townsite in which employees and their families will live, will be government owned property and under government supervision. For this reason it may properly be expected that the greater portion of the expense for maintaining health supervision should be borne by the federal government. Since this supervision will have to be carried out in accordance with the laws of Nevada and Arizona, however, a coöperative agreement should be arranged between federal, state, and local health officials whereby each may share in the responsibility of supplying an adequate and effective health service.

As surrounding communities will be directly affected by the prev-

alence or non-prevalence of preventable disease in the vicinity of the Boulder Dam during construction, and it will be an attraction for tourists for all time, it seems that public health supervision should be established on a permanent basis and organized to include the whole of the two adjacent counties, one in Arizona and the other in Nevada.

In order that health policies may be uniform it may be advisable for a single executive to be placed in charge of their formulation and the direction of public health activities. If legal technicalities should make it impossible for a single director to serve in two states, individual health officers for the respective counties could be appointed as assistants to the chief executive or director. The chief director and his assistant county health officers should, alike, be satisfactory to and approved by state health officials and local county officials.

While the above plan is merely suggested for consideration it is believed that through some such organization an efficient health service could be given, not only to those people in the immediate vicinity of construction activities, but to residents and transients alike on a county-wide basis. While it is impossible to estimate accurately at this time the cost of such a health service it is probable that efficient service could be given by a minimum health department personnel for the Nevada county, consisting of a county health officer, two experienced public health nurses, one sanitary inspector, a laboratory technician and an office clerk. For the Arizona county a minimum personnel to include a county health officer, one experienced public health nurse, and an office clerk would probably be sufficient.

In view of the limited normal populations in both of the counties concerned, and in that the greater portion of the time and work of the personnel of the respective county health departments would be given to the immediate vicinity of construction activities, it would be only reasonable to expect that the state and local governments should bear a minor portion of the expenses incurred for public health supervision. Provision, however, should be made looking toward the eventual taking over of the county health departments by the state and local governments. With the federal government providing for the salary of the director in charge, together with furnishing office space and equipment for the personnel of the two county health departments, it is probable that a well rounded public health program on a county-wide basis could be worked out whereby additional funds to provide for salaries and maintenance of field personnel could be borne in suitable proportions by county officials, the state departments of health, the Division of Rural Sanitation of the U. S. Public Health Service, and possibly to some extent by coöperation from the Rockefeller Foundation or other private agencies engaged in public health work.

# Problems of Sanitation at Headquarters Area During Construction of Boulder Dam

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THE Boulder Canyon project act (45 Stat., 1057) approved by the President, December 21, 1928, authorized, subject to future appropriations, the construction of a reservoir of not less than 20,000,000 acre-feet capacity on the Colorado River, the dam to be located at either Black Canyon or Boulder Canyon. It has been decided to locate the dam in Black Canyon (see map), approximately 20 miles downstream from Boulder Canyon. This location is about 30 miles southeast of Las Vegas, Nev., and 65 miles northwest of Chloride, Ariz., shipping points, respectively, on the Union Pacific and Santa Fe Railroads. The river at this point is the boundary line between Arizona and Nevada.

The situation with regard to the construction work at this time is explained in the following quotation from Dr. Elwood Mead, Commissioner of Bureau of Reclamation Service:

Plans for the town are awaiting an appropriation of funds by Congress with which to begin construction work. At the present time, therefore, there is very little information available, as the town site has not even been laid out.

The Act of December 21, 1928, authorizes an appropriation of \$165,000,000 to carry out all the work contemplated, and Congress has been requested to make available immediately \$10,660,000 to build a town and provide the necessary utilities; to build railroads and highways; provide necessary equipment; and start preliminary work on the diversion tunnels.\*

In order to obtain a proper perspective regarding the size of the Boulder Dam project and the magnitude of the problems of public health confronting the United States Government and the states of Nevada and Arizona, there will be given a few facts from official papers of the Reclamation Service. The dam will raise the present water surface 550 feet and the structure will have a total height of about 700 feet. The reservoir behind the dam when filled will be

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\* About June 15 \$10,660,000 was appropriated for this work.

approximately 110 miles long, and the amount of water stored will be sufficient to cover the state of Kentucky one foot deep. This will be the largest artificial body of water in the world.

The top of the dam will be a bridge connecting the transcontinental highways passing through Las Vegas, Nev., and Kingman, Ariz. It is anticipated that the time required to construct the dam and other structures connected with it will be between 7 and 8 years and the average number of employees with their families will be about 4,000. In addition to this number there will be a scattered population in camps, hotels and amusement places along the highways in Nevada and Arizona near the dam site and most likely the population of Las Vegas, Nev., and Chloride and Kingman, Ariz., will be materially increased.

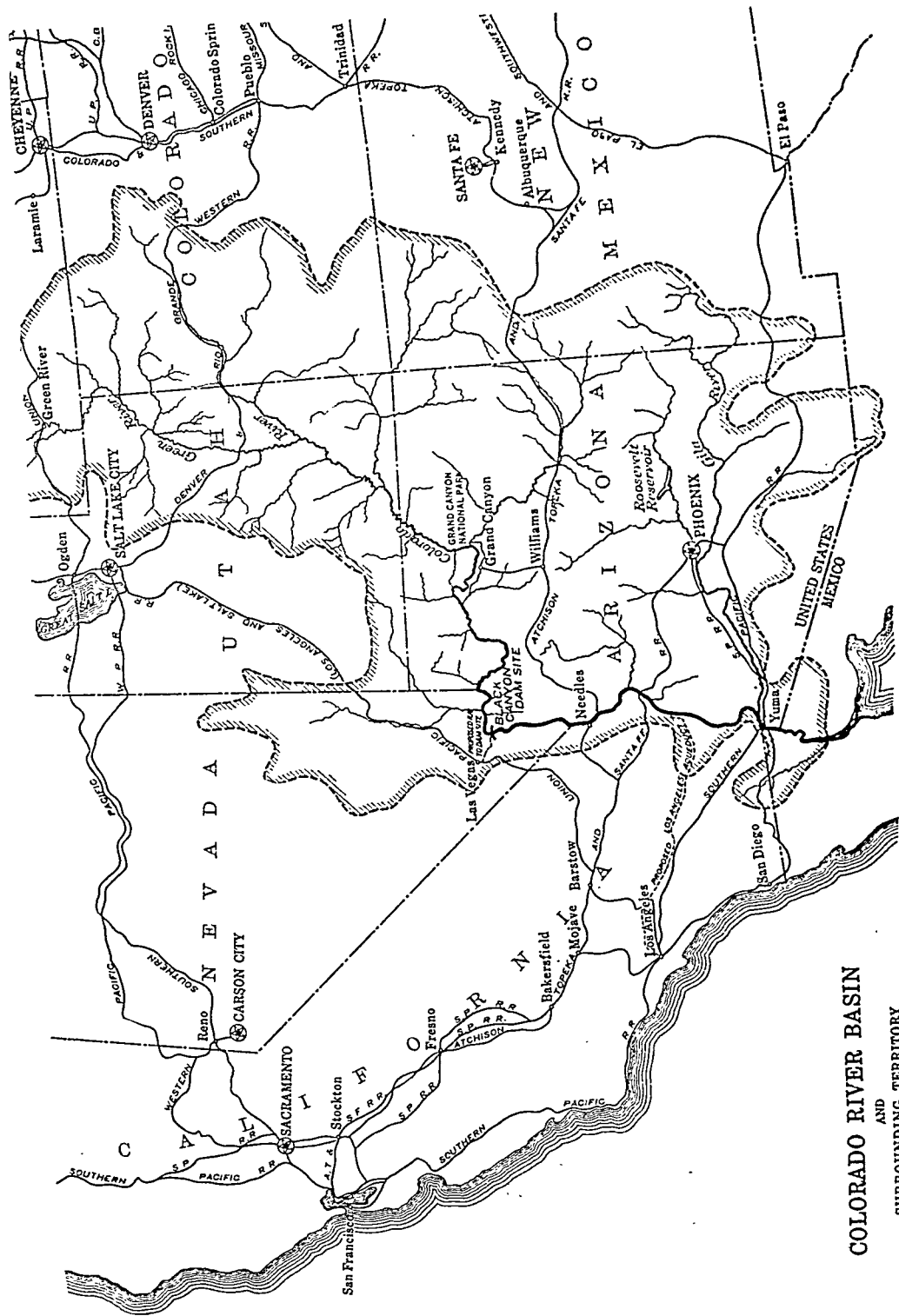
A definite policy has not been decided upon regarding concessions and responsibility for providing housing for workmen and their families. It is stated, however, that:

On contract work the general contractor usually supervises, controls, and operates the major concessions, especially those located in the construction camps, such as commissary, dormitories, mess houses, hospital, etc. Should it be considered advisable to grant a limited number of concessions to others, a suitable area may be set aside in a town site for such purposes. Under present regulations it is customary to grant such privileges only under competitive bids received after public advertisement.

Plans are being made for a town on the brink of the Colorado River for the housing of the workmen who will construct Boulder Dam, and of their families and the normal population necessary to their comfortable existence. The town will be located on government land. The government will retain ownership of the land and lease it to those who live on it or use it for commercial purposes. One of the features of these leases will be that they will continue only under the period of good behavior of the tenant. It is the intention of the government that the bootlegger or other law violator shall not interfere with the well-being of its workmen while assigned to this huge task. The power to terminate leases, and therefore residence, in this town will be used as one of the means of enforcing proper conduct.

#### WATER SUPPLY

The only source of water supply is the Colorado River, which is 800 feet below the proposed town site. The suspended matter in the water varies from a maximum of 4,400 p.p.m. during flood stages to 300 during low water, and the hardness varies from 150 to 530 p.p.m. The town of Yuma, located several hundred miles downstream on the river, uses the water for domestic purposes after treatment by settling, coagulation and passage through rapid sand filters. Above Yuma, however, the river passes through low land where considerable sediment is deposited and the problem of removing sediment at the dam



COLORADO RIVER BASIN  
AND  
SURROUNDING TERRITORY

site will be more difficult than at Yuma. The government has for several years been making turbidity and other analyses of water taken from the river in the Canyon above the site of Boulder Dam and the data available will be valuable in designing a water treatment plant. It has been estimated that the initial developments will cost approximately \$100,000. This, however, does not include force mains and distribution system and storage tanks.

Outside of the area set aside for the town site, there will be located on privately owned or leased land, stores, hotels, camps and amusement places, all of which will have to be supplied with water hauled in tank cars or furnished by the government. Since many of the laborers who will be employed at the dam may live a part or all of their time outside of the town, and since the employees at the dam will mingle with the people living outside the government area, an adequate and pure water supply should be provided not only for the town but for all places that are built up outside and are operated in connection with the work at the dam. This brings up a rather complicated problem of public health since it involves the authorities of the government and the states of Arizona and Nevada.

#### SEWAGE DISPOSAL

No plans or estimates have been made by the government for a sewerage system or treatment plant and no contour map of the area where the new town will be located is available. The country is hilly, arid, sparsely settled, and the only towns diverting water from the Colorado River for domestic purposes are Needles, about 100 miles downstream, Yuma, approximately 250 miles, and El Centro, which takes water from an irrigation canal beyond Yuma. The large dilution factor in the river water together with the long distance before water is diverted for domestic purposes will permit the discharge of partially treated and disinfected sewage into the river, and the nature of the topography of the land and climatic conditions may be favorable for broad irrigation.

The Reclamation Service can locate the town site with a full knowledge of the responsibility for providing water and taking care of sewage for a fairly definite number of people located in one place; but outside and nearby the town site there may develop a serious public health problem in providing adequate sewage disposal for the people attracted to the dam either as prospective laborers or as operators providing services or amusements. With the present labor conditions throughout the country, workmen from every state and from Mexico may go to Boulder Dam in large numbers, and the only places they

can live outside of the new town will be in camps or hotels established along the highways. If it is not practicable for the government to furnish water under pressure to the communities that develop on both sides of the river and beyond the government areas, it will be necessary for the state or county officials of the two states concerned to require installation of either chemical toilets or can privy systems with organizations to take care of them properly, or earth pit privies properly designed.

#### GARBAGE DISPOSAL

The problem of collecting and disposing of garbage and rubbish from the new town and construction camps will be similar to permanent towns of the same size and general location. Although isolated areas are available for disposing of garbage, refuse and tin cans, it is believed that it will be more economical and practical to burn the garbage and bale the tin cans. An incinerator and baling machine of the type used by the National Park Service in the National Parks would be satisfactory for the population anticipated in the new town.

Outside the area under the jurisdiction of the Reclamation Service; there will develop along the highways a problem of collecting and disposing of garbage and refuse from tourist camps, hotels and other places. This problem, however, will no doubt be handled in accordance with some general plan that will be adopted for supervision over sanitation in all the territory adjacent to the dam site.

#### INSECT CONTROL

Malaria exists in southern Nevada and in Arizona and it will be carried to the dam and neighboring territory by employees and tourists. It will be necessary, therefore, at the new town to prevent the breeding of mosquitoes by covering and screening storage reservoirs and to eliminate or oil all vessels of any kind or catch basins that will hold water, and to design and operate the sewage treatment plant so that mosquitoes cannot breed in the sewage. In order to control malaria at the dam, however, it will be necessary to prevent breeding of mosquitoes in the areas in Arizona and Nevada adjacent to the dam as well as the territory immediately around the dam.

The extent of a fly nuisance or menace to health will depend upon the efficiency of the organization and equipment for removing at regular intervals garbage, refuse, stable manure, and the construction of earth pit toilets so that flies cannot enter them.

It is not only possible but practicable to reduce the breeding places of mosquitoes and flies to a minimum and to screen houses to prevent



the entrance of these insects. It would appear, therefore, that the only problem involved in this matter is an organization to handle the work and the coöperation of the three different authorities having jurisdiction.

#### FOOD SUPPLIES

There will be constructed a branch railroad line from the Union Pacific System at Las Vegas to the new town at the dam on the west side of the river and possibly another branch from Chloride on the Santa Fe lines to the east side. This will insure delivery of food supplies in proper condition directly to the dam. The main problem, therefore, in connection with the food supplies in relation to public health will be the handling of the food after delivery. Since the temperature at the dam site varies from a minimum of 20° F. to a maximum of 120° F., it will be necessary to provide adequate refrigeration for perishable foods and to inspect at regular intervals all places storing, handling and serving food products.

#### CONCLUSIONS

The Reclamation Service has constructed large dams in the Southwest and is familiar with the problems of public health that develop in a large population gathered together from different sections of the country in a new town or camps. The situation at Boulder Dam, however, differs from the construction at other dams, because of the size of this project and the location on the boundary line of two states. As already stated, there will be approximately 4,000 people living at the headquarters area and other places on government owned land, and in addition there may be a large number of people living outside the government areas but adjacent to them in Arizona and Nevada. All of these people will form one large community, but authority over public health will be divided between the officials of the government and the states of Arizona and Nevada. It would appear, therefore, that it will be necessary to establish efficient health organizations in the counties of Arizona and Nevada bordering on the area around the dam, and for the health officials of these two counties and the government to work in close coöperation. If appropriations cannot be obtained in the states for carrying on the necessary health work, the government should either provide the necessary funds or work out a plan with the health officials of these two states whereby the Reclamation Service would accept the responsibility for sanitation and other matters pertaining to public health in a limited zone around the headquarters area.

## DISCUSSION

R. J. STROUD, M. D.

*Health Officer, Phoenix, Ariz.*

DR. FOARD asked me to say a word about Indians. In Arizona projects—and there have been five major ones, four in Salt River and one on the Gila River—we have employed an average of 22 per cent Indians. Whether in a project as large as this there will be that many Indians, we do not know, but if there should be, we will have quite a problem.

There are several kinds of Indians. The good fighters are the good workers. The Apache is a wonderful worker. Contractors in that section like to have the Apache Indians as laborers. They have never built permanent places for they are not farming people as are the Pimas, Maricopas, and others. They want to go out and work, but insist upon one thing, and that is that they live by themselves in their own communities. During all of our constructions, the Indians were given home sites in a little canyon where they could be by themselves.

Indians and Mexicans get along very peaceably with the flies. They do not make any attempt to kill them, but seem to feel that they are just a part of their daily bread. If the Indians are restricted in any way, they will simply move just outside of the government franchise, for they will live their own lives. While they like work, they believe in the women doing the work at home. The smoke curls through the ceiling of their tepees, and they chop their wood long and burn the end only, the other end protruding outside. Where this little piece of wood passes in there is going to be a fly menace—an opening where flies can go through.

The next problem is the Indian child. Primitive races have tuberculosis young. They do not die at 18 to 25 years of age, but from 6 to 14. At least 25 per cent of these children can be proved tuberculous by the stethoscope. Because it is natural for children to fraternize, these children will mix with other children, especially if they are put into the same schools.

While the Indians will tolerate inoculation, they will not stand for segregation. There are some things you cannot do with an Indian, and this is one of them. If you try to pin a measles sign on his door, he will just move right out. This is a problem you will have—spreading tuberculosis, trachoma, and venereal diseases among his own people, and then going out and mixing among the other people under a very loose control.

LEON B. REYNOLDS

MOST of those who have felt that the increase in salt content would be inappreciable have based their conclusions partially on the slow solution of salt in the salt cliffs, partially on the feeling that the silt content of the water itself would settle out and cover up those beds with a blanket, or silt cover, which would prevent further solution, and partially on the belief that the silt cover which is on top of those cliffs would prevent further solution. As far as the silt blanket is concerned, it seems to me that the silt coming from the Colorado itself will naturally be deposited as soon as the water is stilled, which would be up at the upper end of the 90- or 100-mile reservoir, and that probably only small portions

of it would continue down as far as the point where the Virgin River empties, probably fifty or sixty miles from the upper end of the reservoir. For that silt to continue in the water down as far as the entrance of the Virgin River seems to me rather unlikely. On the other hand, silt from the Virgin River might be useful in providing a silt bed on those salt cliffs. I am not very familiar with the characteristics of the Virgin River as to whether it carries sufficient silt to accomplish that or not.

The engineers who have studied the proposition have decided that the best location for the dam, all things considered, is at the Black Canyon, at least for the first development, that it would be more useful due to being nearer the center of power distribution, and better for de-silting of the river at that location than at the Bridge Canyon site.

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RESOLUTION NO. V

*Adopted by the Western Branch of the American Public Health Association,  
June 14, 1930*

WHEREAS, the construction of the Boulder Dam will present inter-state health and sanitary problems involving the United States Government and two sovereign states; and

WHEREAS, certain contracts may be let to private contractors for construction of various units of the dam; and

WHEREAS, the health and sanitary problems developing will directly or indirectly affect the local population as well as that in the surrounding states, now therefore be it

RESOLVED, that it is the sense of the Western Branch of the American Public Health Association, now in session in Salt Lake City, that the importance of these problems which will develop be given careful study by the Secretary of the Interior, the Surgeon General of the U. S. Public Health Service, and the State Health Departments of Arizona and Nevada, with the view to consolidating their efforts into a uniform plan of procedure; and be it further

RESOLVED, that it is recommended that such coördinated activities be agreed upon in advance of construction work.

# Milk-Borne Disease in Massachusetts, 1927-1929\*

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FILIP C. FORSBECK, M. D.

*Commissioner, Massachusetts Department of Public Health; and Research Fellow,  
Harvard School of Public Health, Boston, Mass.*

PREVIOUS chronological reports of milk-borne disease in Massachusetts<sup>1,2,3,4</sup> have been published covering periods of from three to eight years. During the past three years the menace of inadequately protected milk supplies has been more forcibly brought to attention than ever before, particularly because of an outbreak of septic sore throat resulting in 48 deaths.<sup>5,6,7,8</sup> Moreover, progress in the protection of milk supplies has been more rapid in Massachusetts than ever before. It is thought desirable, therefore, to bring previous data up to date at this time, and to increase the number of items studied. Certainly it is utterly futile to carry on an intelligent program among laymen, producers, dealers, and boards of health, without being able to present the facts about the current milk situation. Many groups rightfully expect the State Department of Public Health to be a clearing house for this type of statistical information.

Questionnaires covering the year 1928 were sent to the 125 Massachusetts cities and towns of over 5,000 population, which represent over 90 per cent of the entire population of the state. Replies were received from 95 communities, 76 per cent of all those receiving the questionnaires. These communities represent 83 per cent of the total population of the state. In previous reports only communities of over 10,000 population were studied. We have found that the towns in the 5,000-10,000 group have, as a whole, been unable to supply satisfactory information relative to the milk situation in their respective towns. It is our opinion that most progress is needed in this group at the present time. The group has a population of about 400,000, and yet has a milk supply which, in general, is very poorly protected.

Table I gives information relative to the towns answering the questionnaire.

In Table II are listed the total reported cases of certain diseases by years, the number, and the percentage traced to milk. There is

\* Fifth Chronological Report from the Massachusetts Department of Public Health.

TABLE I  
INFORMATION RELATIVE TO COMMUNITIES ANSWERING QUESTIONNAIRE

<i>Groups</i>	<i>Communities in Group</i>	<i>No. of Communities Answering Questionnaire</i>	<i>% Answering Questionnaire</i>	<i>Pop. of Group Answering Questionnaire<sup>b</sup></i>
50,000 and over (I)	17	17	100.0	2,342,242
25,000-50,000 (II)	13	11	84.7	436,002
15,000-25,000 (III)	25	22	88.0	414,593
10,000-15,000 (IV)	19	15	78.9	184,715
5,000-10,000 (V)	51	30	58.8	226,701
Totals	125	95	76.0 <sup>a</sup>	3,604,253

<sup>a</sup> In subsequent tables the population groups will be designated by Roman numerals.

<sup>b</sup> Estimated 1928 population of state—4,324,873.

<sup>c</sup> Means in this and all subsequent tables are weighted.

undoubtedly considerable error in this set of figures. For example: Septic sore throat was not made reportable until 1914; morbidity reporting is far from perfect, and varies in its accuracy with different diseases; it is frequently impossible to state the exact number of cases due to milk-borne disease; and finally, small obscure outbreaks might be missed entirely.

Nevertheless, there are several interesting trends which are worth noting. Since 1906 there has been a decrease of milk-borne disease at the rate of about 12 per cent per year, if the Lee outbreak is not included, and at the rate of about 5 per cent if it is included. The percentage of diphtheria and of septic sore throat traced to milk has remained fairly constant, although in the latter case the period is too short to be of much value statistically. During the period 1906-1929, the percentage of scarlet fever traced to milk decreased at the rate of about 15 per cent per year, while during the period 1896-1929 the percentage of typhoid fever cases traced to milk increased at the rate of about 5 per cent per year.

This difference in typhoid fever and scarlet fever trends may be logically accounted for in this way: Typhoid fever is being dealt with so successfully in other ways that, in spite of the increasing amount of pasteurized milk, the disease is finding milk to be more and more its stronghold as compared with water, for example. In the case of scarlet fever, however, efforts up to the last two or three years have been almost futile, probably the only real advance being the protection offered by the increased use of pasteurized milk. Hence the decline in the percentage of cases traced to milk.

Table III shows the seasonal distribution of milk-borne disease by cases and outbreaks over a period of 44 years. The curve is bimodal, the first and minor peak occurring in April because of the prevalence of septic sore throat and scarlet fever outbreaks, and the second and major peak in August and September because of the prevalence of typhoid fever outbreaks. In each of the four diseases studied, about

TABLE II  
PROPORTION OF CASES OF TYPHOID FEVER, SEPTIC SORE THROAT, SCARLET FEVER AND DIPHTHERIA TRACED TO MILK, 1896-1929

	Typhoid Fever			Septic Sore Throat			Scarlet Fever			Diphtheria			Totals	
	Cases <sup>d</sup>	Milk <sup>e</sup>	% <sup>f</sup>	Cases	Milk	%	Cases	Milk	%	Cases	Milk	%	Yearly Mean	Yearly Per Mean Cent
1896-1900	12,680	266	2.1	0	0	—	24,708	0	0.0	39,883	42	0.1	15,454	62
1901-1905	14,036	264	1.9	0	0	—	23,059	146	0.6	36,270	0	0.0	14,673	0.6
1906-1910	15,207	1,226	8.1	0 <sup>b</sup>	(200)	—	36,254	1,364	3.8	41,467	88	0.2	18,585	82
1911-1915	11,261	600	5.3	905	(3,156)	—	39,538	462	1.2	36,534	36	0.1	92,928	536
1916-1920	6,001	417	6.9	746	683	75.5	34,992	140	0.4	39,968	47	0.1	17,467	220
1921-1925	3,390	228	6.7	1,772 <sup>c</sup>	1,034	58.3	53,228	109	0.2	38,716	32	0.1	16,373	257
1926-1929	1,635	135	8.3	1,772 <sup>c</sup>	1,034	58.3	48,314	157	0.3	16,459	0	0.0	19,216	89
Totals	64,209	3,136	4.9	3,423	1,792	52.3	260,093	2,378	0.9	249,297	245	0.1	17,043	331
													16,971	222
													577,018	1.3

<sup>a</sup> Total does not include septic sore throat.<sup>b</sup> Septic sore throat made reportable September, 1914.<sup>c</sup> Includes 660 cases in the Lee outbreak and 71 in the Charlton outbreak not officially reported.<sup>d</sup> Cases reported during period.<sup>e</sup> Cases traced to milk.<sup>f</sup> Percentage of reported cases traced to milk.TABLE III  
SEASONAL DISTRIBUTION OF CERTAIN MILK-BORNE DISEASES BY CASES AND OUTBREAKS, 1886-1929

Disease	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Unknown	Total
<b>Typhoid Fever</b>														
Outbreaks	5	2	8	3	4	3	15	26	27	10	8	61	5	122
Cases	211	11	566	101	154	22	331	910	596	143	174	154	37	3,410
Cases per Outbreak	42	5	71	33	38	7	22	31	22	14	22	26	7	27.9
<b>Septic Sore Throat</b>														
Outbreaks	2	2	0	5	4	4	2	0	0	1	0	0	0	20
Cases	67	1,125	0	1,185	1,443	1,142	179	0	0	7	0	0	0	5,148
Cases per Outbreak	33	562	0	237	361	285	89	0	0	7	0	0	0	257.0
<b>Scarlet Fever</b>														
Outbreaks	5	2	4	5	3	0	2	1	1	0	0	3	0	26
Cases	696	12	199	885	18	0	75	14	400	0	0	83	0	2,382
Cases per Outbreak	139	6	50	177	6	0	37	14	400	0	0	28	0	91.7
<b>Diphtheria</b>														
Outbreaks	0	1	0	3	1	1	0	1	3	0	1	0	1	12
Cases	0	30	0	104	9	50	0	33	41	0	16	0	12	295
Cases per Outbreak	0	30	0	34	9	50	0	33	14	0	16	0	12	24.6
<b>Totals</b>														
Outbreaks	12	7	12	16	12	8	19	28	31	11	9	9	6	180
Cases	974	1,178	765	2,275	1,624	1,214	585	957	1,037	150	190	237	49	11,235
Cases per Outbreak	81	168	6	142	134	152	31	34	33	14	21	26	8	62.4

80 per cent of the outbreaks occur in one-half of the year. This period is blocked-off in Table III and is summarized in Table IV. It is interesting to note that scarlet fever and septic sore throat, which have so many common characteristics, are alike in the seasonal distribution of milk-borne outbreaks. This fact has been noted by Scamman for the state as a whole.<sup>9</sup> We have no explanation for the fact that the milk-borne outbreaks of diphtheria tend to occur at the opposite time of the year to the general incidence.

In the case of typhoid fever, the seasonal distribution of milk-borne outbreaks cannot entirely be accounted for on the basis of an increase of general incidence. Many of the outbreaks are due to carriers, and their number may be presumed to have no seasonal variation. Table V contains information relative to typhoid fever outbreaks caused by cases and by carriers. It shows that outbreaks due to carriers have a seasonal distribution similar to the typhoid fever curve of general incidence. The seasonal increase is probably due to one or more of the following factors:

1. Increased vulnerability of the milk
2. Increased output of *B. typhosus*
3. Increased virulence of the organism
4. Increased susceptibility of the individual

Vulnerability of the milk supply is certainly a minor factor if it plays any rôle, since the peak is not coincidental with the heat peak. To study the bacterial output of carriers by seasons would give information which might throw considerable light on the epidemiology of typhoid fever.

As a matter of fact, the median outbreak due to a carrier occurs about two weeks before the median outbreak caused by a case. The

TABLE IV

CASES, OUTBREAKS, AND CASES PER OUTBREAK IN EPIDEMIC AND NON-EPIDEMIC HALF YEARS

Disease	Epidemic Half Year	Outbreaks					
		Epidemic ½ yr.		Non-Epidemic ½ yr.			
		No.	%	No.	%		
Typhoid Fever	July-Dec.	92	78.6	25	21.4		
Septic Sore Throat	Jan.-June	17	85.0	3	15.0		
Scarlet Fever	Dec.-May	22	84.6	4	15.4		
Diphtheria	Apr.-Sept.	9	81.7	2	18.3		
Totals		140	80.5	34	19.5		

Disease	Epidemic Half Year	Cases		Non-Epidemic		Cases Per Outbreak	
		Epidemic ½ yr.		½ yr.		Epidemic	Non-Epidemic
		No.	%	No.	%	½ yr. No.	½ yr. No.
Typhoid Fever	July-Dec.	2,308	68.5	1,065	31.5	25.1	42.6
Septic Sore Throat	Jan.-June	4,962	96.2	186	3.8	292.0	62.0
Scarlet Fever	Dec.-May	1,893	79.4	489	20.6	86.0	122.2
Diphtheria	Apr.-Sept.	237	83.7	46	16.3	26.1	23.0
Totals		9,400	84.2	1,786	15.8	67.1	52.5

TABLE V

SEASONAL DISTRIBUTION OF TYPHOID FEVER OUTBREAKS BY MODE OF INFECTION

	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total
Case	1	1	1	1	2	0	5	4	8	4	1	1	29
Carrier	1	1	2	3	0	3	4	8	5	3	2	2	34

TABLE VI

THE RELATIVE NUMBER OF MILK-BORNE OUTBREAKS OF TYPHOID FEVER DUE TO CASES AND CARRIERS

	Cases		Carriers	
	No.	%	No.	%
First 16 outbreaks	11	69	5	31
Second 16 outbreaks	10	63	6	37
Third 16 outbreaks	7	44	9	56
Fourth 16 outbreaks	3	19	13	81
	31	48	33	52

only explanation we can offer is that of recent years there have been more outbreaks due to carriers, and the more recent outbreaks have been occurring earlier coincidentally with an earlier seasonal distribution. The possibility of such changes has been noted by Rosenau<sup>19</sup> and by Mills.<sup>20</sup>

The recent increase in the relative number of outbreaks known to be caused by carriers is illustrated in Table VI. The explanation is two-fold: Only in recent years have we become actively cognizant of carriers, and each year greater effort is made to find them. The number of carriers is not decreasing so rapidly as the number of cases.

In Tables VII and VIII are shown the relative frequency of cases and outbreaks, respectively, of the four diseases considered. These tables show that, of milk-borne disease in Massachusetts, there are more outbreaks of typhoid fever, but more cases of septic sore throat. If just the past twenty years are considered, septic sore throat is still more relatively important.

Since 1911, outbreaks and cases have been decreasing at the rate of about 10 per cent per year, if the Lee outbreak is included; while cases have been decreasing at the rate of about 16 per cent per year, if the Lee outbreak is excluded. In other words, outbreaks are becoming limited to smaller dealers as time goes on, largely because of the fact that pasteurization is being more fully utilized by the larger dealers. The dilution incident to the larger supplies may also be a factor. In a period of about twenty years, the case rate of milk-borne disease has been about 41 per cent higher in communities under 10,000 population than in communities over 10,000. This reflects the high percentage of protection offered by pasteurized milk in the larger communities.



TABLE VII  
PERCENTAGE DISTRIBUTION OF MILK-BORNE DISEASE BY CASES

	Typhoid Fever		Septic Sore Throat		Scarlet Fever		Diphtheria		Total	
	Cases	% <sup>a</sup>	Cases	Mean %	Cases	Mean %	Cases	Mean %	Mean	%
1886-1890	50	10.0	0	0.0	4	0.8	50	10.0	104	100.0
1891-1895	224	44.8	0	0.0	0	0.0	0	0.0	224	44.8
1896-1900	266	53.2	0	0.0	0	0.0	42	8.4	308	61.6
1901-1905	264	52.8	0	0.0	146	29.2	0	0.0	410	82.0
1906-1910	1,226	245.2	200	40.0	1,364	272.8	88	17.6	2,878	575.6
1911-1915	600	120.0	3,156	631.2	462	92.4	36	7.2	4,254	850.8
1916-1920	417	83.4	683	136.6	140	28.0	47	9.4	1,287	257.4
1921-1925	228	45.6	75	15.0	109	21.8	32	6.4	444	88.8
1926-1929	135	33.8	1,034	258.5	157	39.2	0	0.0	1,326	331.5
Total	3,410	77.5	5,148	117.0	2,382	54.1	295	6.17	11,235	255.3

<sup>a</sup> Per cent of total milk-borne diseaseTABLE VIII  
PERCENTAGE DISTRIBUTION OF MILK-BORNE DISEASE BY OUTBREAKS

	Typhoid Fever		Septic Sore Throat		Scarlet Fever		Diphtheria		Total	
	Outbreaks	%	Outbreaks	Mean %	Outbreaks	Mean %	Outbreaks	Mean %	Mean	%
1886-1890	1	0.2	0	0.0	1	0.2	1	0.2	3	0.6
1891-1895	5	1.0	0	0.0	0	0.0	1	0.2	6	1.2
1896-1900	13	2.6	0	0.0	0	0.0	2	0.4	15	3.0
1901-1905	17	3.4	0	0.0	5	1.0	0	0.0	22	4.4
1906-1910	21	4.2	1	0.2	5	1.0	2	0.4	29	5.8
1911-1915	30	6.0	8	1.6	6	1.2	2	0.4	46	9.2
1916-1920	19	3.8	7	1.4	4	0.8	2	0.4	32	6.4
1921-1925	11	2.2	2	0.4	2	0.4	2	0.4	17	3.4
1926-1929	5	1.3	2	0.5	3	0.8	0	0.0	10	2.5
Total	122	2.8	20	0.5	26	0.6	12	0.3	180	4.1

TABLE IX  
CHRONOLOGICAL CHANGE IN SIZE OF MEAN AND MEDIAN OUTBREAK

Quinquennium	Cases		Cases per Outbreak		Median Outbreak	
	Outbreaks <sup>a</sup>	Mean %	Outbreaks	Mean %	Inc. Typhoid Fever, Diphtheria, and Septic Sore Throat	Inc. Typhoid Fever, Diphtheria, and Scarlet Fever
1886-1890	3	104	35	50	50	50
1891-1895	4	224	56	40	40	40
1896-1900	15	308	21	17	17	17
1901-1905	20	410	21	17	17	17
1906-1910	28	2,878	103	36	36	33
1911-1915	45	4,255	95	18	18	12
1916-1920	32	1,287	40	16	16	9
1921-1925	17	444	26	11	11	11
1926-1929	10	1,326	133	29	29	22

<sup>a</sup> Including only those outbreaks for which the number of cases is known more or less accurately.

In Table IX are listed those outbreaks for which the number of cases are fairly definitely known. From this table we have calculated the mean number of cases and outbreaks by quinquenniums. The average number of cases per outbreak has been increasing at the rate of about 1.6 per cent per year. This increase in the mean number of cases per outbreak is due entirely to the tremendous outbreaks of septic sore throat in recent years. As a matter of fact, the median outbreak is decreasing as would be expected when one considers that the larger milk dealers take up pasteurization with greater readiness than the smaller ones. If one includes the septic sore throat outbreaks, the size of the median outbreak since 1886 has been decreasing at the rate of 1.8 per cent per year; while if septic sore throat is not included, the size of the median outbreak has been decreasing at the rate of 3.3 per cent per year.

TABLE X  
LIST OF OUTBREAKS TRACED TO MILK  
1927-1928-1929

Year	Month	Place	Disease	Cases	Deaths	Source	Milk Pasteurized or Raw
1927	Mar.	Billerica	Typhoid Fever	23	1	Carrier (Milk Farm)	Raw
1928	June-July	Lee	Septic Sore Throat	950	48	Cow (possibly infected by case)	Raw
1928	July	Pembroke-Marshfield	Scarlet Fever	15	0	Case (?)	Raw
1928	July-Aug.	Medway	Typhoid Fever	5	0	Unknown	Raw
1928	Aug.	Littleton	"Gastrointestinal"	20	0	Unknown	Raw
1928	Aug.-Sept.	Worcester	Dysentery	126	17	Carrier	Pasteurized*
1929	Mar.	Frammingham	Scarlet Fever	15	0	Case (?)	Raw
1929	Mar.	Plymouth	Scarlet Fever	127	0	Case (?)	Raw
1929	June	Charlton	Septic Sore Throat	84	2	Case	Raw

\* Milk placed in 20- and 40-quart cans after pasteurization and infected by a carrier who as a food handler transferred the milk from the cans to the cups of patients in an institution for mental disease.

NOTE: Some cases never officially reported, but found by special investigation.

Table X lists the outbreaks traced to milk in 1927, 1928, and 1929. Nineteen twenty-nine is the first year since the first outbreak of typhoid fever was reported, in 1886, that has not witnessed an outbreak of milk-borne typhoid fever. There has been no outbreak of milk-borne diphtheria for four years.

Table XI shows the per capita consumption of milk. No significant change in this is noted, although the value of milk as a food is being urged in the schools and elsewhere. It will be seen that the reported per capita consumption is greater in the larger communities. It is not known whether the per capita consumption is greater in rural or urban communities. Undoubtedly the figures are greatly influenced by the fact that home consumption of home production is not included in the milk statistics of boards of health. The per capita milk consumption is an important measuring stick from both commercial and health points of view, and we are convinced that the

TABLE XI

## THE PER CAPITA CONSUMPTION OF MILK

Group	No. of Communities Answering Item		Quarts Sold Daily	Quarts Per Capita
Towns of all sizes	?	1919	1,350,000	0.56
		1923		
I	12		836,937	0.46
II	10		212,164	0.50
III	10		79,877	0.38
IV	9		42,768	0.38
	41		1,171,746	0.46
		1926		
I	15		1,145,834	0.52
II	10		217,435	0.50
III	12		83,684	0.36
IV	6		35,406	0.43
	43		1,482,359	0.50
		1928		
I	17		1,096,399	0.47
II	11		192,757	0.44
III	20		154,855	0.41
IV	14		61,769	0.36
Subtotals	62		1,505,780	0.45
V	26		75,166	0.38
Totals	88		1,580,946	0.45

questionnaire is not accurate enough to be satisfactory for this purpose. The U. S. Department of Agriculture, working in collaboration with the State Departments of Agriculture, of Conservation, and of Health, are planning periodic surveys which will give this information with greater accuracy.

The milk consumed in Massachusetts is produced in the New England States, New York, and Quebec. It is estimated that 62.4 per cent of the milk consumed in the communities answering this item of the questionnaire is produced in Massachusetts.

As one would expect, the percentage of home production increases quite uniformly with the decrease in the size of the community. Thus, in communities of over 50,000 about 40 per cent of the milk is imported from other states, while in the communities of 5,000 to 10,000 about 14 per cent is imported from other states.

A very encouraging item is the continued increase in the percentage of pasteurized milk. There has been a substantial increase in each of

TABLE XII

## COMMUNITIES IN MASSACHUSETTS WHICH REQUIRE THAT ALL MILK BE EITHER PASTEURIZED OR FROM TUBERCULOSIS-FREE CATTLE (1929)

Group	Number of Towns in Group	No. of Towns Having Reqm.	% of Towns Having Reqm.	Pop. of Group	Pop. having Requirement	%
50,000—Over	18	15	83.3	2,413,960	2,123,788	88.0
25,000—50,000	12	8	66.7	471,157	315,592	67.0
15,000—25,000	27	13	48.1	513,533	261,278	50.8
10,000—15,000	18	8	44.4	219,033	98,093	44.7
5,000—10,000	52	9	17.3	372,634	66,641	17.8
2,500—5,000	61	9	14.7	208,106	31,935	15.3
1,000—2,500	85	11	12.9	140,732	18,427	13.1
0—1,000	82	5	6.1	41,308	2,953	7.1
Totals	355	78	22.0	4,380,463	2,918,707	66.6

the population groups considered, and while for all the groups the total percentage has increased from 83 per cent to 85.7 per cent, the total for the first four groups has increased from 83 per cent to 87 per cent. Almost 25 per cent of the milk sold raw in communities of over 10,000 in 1926 is now pasteurized. As one would expect, the percentage of pasteurized milk is highest in the larger communities. The range is from nothing to over 99 per cent. However, some of the smaller communities are outstanding in the exceptional relative amount of pasteurized milk used. This is very encouraging, but on the other hand it is very discouraging to note that in a number of large cities the per cent of pasteurized milk ranges around 40 to 50 while other cities of corresponding size have more than 99 per cent of their milk pasteurized. When we consider that, in general, the larger routes are in the larger places, we realize (thinking quantitatively) that the menace of milk-borne disease is concentrated in a few particularly lax, fairly large communities.

The percentage of certified milk has increased from about 0.6 per cent to about 1 per cent. Because of the small figures this information is not so accurate as for pasteurized milk, but undoubtedly there has been an increase in the use of certified milk. It is of interest that this increase has occurred to a greater extent in smaller communities.

Of the 355 cities and towns in the state, 208 (58.6 per cent) report having some milk inspector. All communities over 25,000 so report, but there are 12 between 5,000 and 25,000 without any. Surely this is not good! Moreover, milk inspection, when it does exist, is as poor in some communities as it is good in others.

In 1926, communities giving this data report 10.3 chemical and 4.9 bacteriological examinations per 100,000 quarts of milk, while in 1928 the figures are 10.4 and 5.4, respectively. They report that 13.1 per cent of the samples of raw milk not intended for pasteurization showed counts over 300,000 per c.c. It is distressing that a number of communities allow milk to be sold raw which under our present regulations would not be accepted for pasteurization. In 55 communities the average percentage of total solids was 12.59, while from 62 communities the per cent of butter fat was 3.81. In general, these figures increase somewhat from larger to smaller communities.

Table XII shows the communities in Massachusetts, by population groups, which require that all milk be either pasteurized or from tuberculosis-free cattle. We have reached the paradoxical situation in which it is safer for children to secure their milk in most urban communities than in most rural communities.

## SUMMARY

This report is based upon data from 95 of the 125 communities over 5,000 and covers 3,604,314, or 83 per cent of the entire population of the state. We are impressed that the smallest of these communities have almost no protection of their milk supplies.

The proportion of all typhoid fever traced to milk has been increasing markedly, while for scarlet fever it has been decreasing. Over the period of 34 years, the four diseases considered range themselves by outbreaks in the following order of magnitude: typhoid fever, scarlet fever, septic sore throat, and diphtheria; but by total cases in the following order of magnitude: septic sore throat, typhoid fever, scarlet fever, and diphtheria. As pointed out in our preceding report,<sup>1</sup> the rate of decrease of total cases spread by milk is greater than the decrease of outbreaks so spread. This suggests that fewer persons are exposed to each outbreak, and that therefore they tend to occur in a higher proportion of instances on smaller milk routes than formerly. This bears out the evidence that the smaller dealers less frequently protect their milk by pasteurization.

Nineteen twenty-nine is the first year, since the first outbreak of typhoid fever was reported, that has not witnessed a milk-borne outbreak of this disease. There has been no outbreak of diphtheria for four years.

Although the data are open to question, there is no evidence of an increasing consumption in milk over a 10-year period, in spite of the intensive health and commercial propaganda on this subject. As would be expected, the proportion of Massachusetts produced milk increases with the decreasing size of the community.

Since 1919 there has been an encouragingly marked increase in the proportion of milk pasteurized, in general being higher in the larger communities. On this, more than any other single factor, must we depend for the eventual obliteration of milk-borne disease.

Although the figures are too small to be of much significance to the public health, the apparent increase of certified milk would suggest a growing realization that if raw milk is to be consumed, it must have the maximum protection. The recent discussion of certified-pasteurized milk, which to us seems to be the ideal milk, leads to the hope that this product may eventually become a factor in our milk supply.

It is shocking to learn that 147, or 41.4 per cent of our communities, have no shadow of an inspector of milk, the most important and vulnerable of our foods. When we see that 12 of these communities have populations over 5,000, our patience is well nigh exhausted, particularly if we consider also the number reporting inspection which is gravely inadequate. In the last two years there has been a slight increase in the protection offered by the bacteriological examination of milk.

With varying competence in laboratory service, the proportion of high counts by communities is opened to much question. But our data would substantiate the general impression that all in all the larger the community the cleaner and safer the milk, because of better regulations, more competent inspection and more pasteurization.

The percentage of total milk solids and butter fat by population groups shows nothing striking.

There has been a most encouraging increase in the number of communities annually adopting regulations requiring that all milk be either pasteurized or from tuberculosis-free cattle. This has been most marked in the larger communities.

However, since there are still 30 per cent of our people who live in cities and towns which allow raw milk from tuberculous cattle to be sold, this movement against milk from tuberculous cattle must be expedited by state regulation.

NOTE: We are indebted to Helen Smith of the Department staff for valuable assistance in the preparation of the statistical tables.

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## Commonwealth of Massachusetts

THE State Department of Public Utilities has issued an order specifying the contents of first-aid packages to be carried by railroads.

The present order provides that every railroad corporation shall carry upon each engine or rail motor car and in a car of each passenger train and in the caboose car of each freight train at least one first aid package containing:

1. Four aseptic gauze pads for large wounds,  $2\frac{3}{4}$ " by 3", made of 12 thicknesses of No. 1 A gauze, with a gauze bandage 2" wide and 60" long attached for fastening pad to wound, and with the pad sewed to the middle of the bandage.

2. Four aseptic gauze pads for small wounds,  $1\frac{1}{2}$ " by 2", made of 12 thicknesses of No. 1 A gauze, with gauze bandage 1" wide and 18" long.

Said gauze pads and bandages to be contained in individual glassine envelopes, those containing small dressing to be marked "For Small Wounds" and those containing large dressings to be marked "For Large Wounds."

3. Four mercuriopoly applicators of a size not less than those contained in a packet marked "A" and dated July 25, 1930, on file with the railway and motor bus inspection division of the department.

4. One-quarter ounce of bicarbonate of soda and petrolatum for burns.

# An Effective and Practical Definition of Pasteurization\*

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**A**N effective and practical definition of pasteurization should satisfy the following criterions:

1. It must be effective with respect to the killing of any pathogens in milk.
2. It must be practical with respect to its enforcement by the health official.
3. It must be practical with respect to its application by the dairy industry.

The 1929 issue of the *Standard Milk Ordinance and Standard Milk Control Code*, recommended to American municipalities by the U. S. Public Health Service, contains the following definition of pasteurization which it is believed satisfies the above criterions.

Pasteurization—The terms “pasteurization,” “pasteurized,” and similar terms shall be taken to refer to the process of heating every particle of milk or milk product to a temperature of not less than 142° F., and holding at such temperature for not less than 30 minutes in pasteurization apparatus approved by the health officer, provided that approval shall be limited to such apparatus which requires a combined holder and indicating thermometer temperature tolerance of not more than one and one-half degrees Fahrenheit (1½° F.), as shown by official test with suitable testing equipment, and provided that such apparatus shall be operated as directed by the health officer and so that the indicating thermometers and the recording thermometer charts both indicate a temperature of not less than 143½° F., continuously throughout the holding period, provided that nothing contained in this definition shall be construed as disbaring any other process which has been demonstrated as of at least equal efficiency and is approved by the state health authority.

It will assist in understanding why this definition satisfies the three criterions if we first examine it in detail and ascertain the reasons for each clause or phrase of which it is composed.

The first clause, namely, that “pasteurization . . . shall be taken to refer to the process of heating every particle of milk to 142° F. and holding at such temperature for not less than 30 minutes,” is the

\* Read at a Joint Session of the Food, Drugs and Nutrition and Public Health Engineering Sections of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 3, 1929.

"core" of the definition. It implies, of course, that a temperature of  $142^{\circ}$  F., if actually applied to every particle of milk for 30 minutes, will kill or render non-dangerous any milk-borne pathogens which may be present. It is believed that the majority of leading bacteriologists will concur in this assumption.

The second clause, "in pasteurization apparatus approved by the health officer," is included in the definition because failure to include it might lead to disagreement between health officers and pasteurization plant owners or pasteurization machinery manufacturers, as to whether a given type of pasteurization equipment is so designed as to be capable of reliably applying a temperature of  $142^{\circ}$  F. to every particle of its milk contents for 30 minutes. Some agency must have final authority to pass upon such questions and it is believed that the health officer is the proper agency.

It is suggested that the health officer's approval should be based in general upon whether the apparatus in question complies with the design specifications contained in the *Standard Milk Control Code* recommended by the U. S. Public Health Service, since this will have the advantage of promoting standardized design requirements; and in particular upon whether the apparatus meets the temperature tolerance provision of the next clause of the definition. Whether the apparatus complies with the first requirement may be ascertained by simple inspection of the apparatus itself, or its blue prints. Whether the apparatus complies with the second requirement can be determined only on the basis of records of actual official tests.

The third clause, "provided that approval shall be limited to such apparatus which requires a combined holder and indicating thermometer temperature tolerance of not more than  $1\frac{1}{2}^{\circ}$  F.," is included in the definition because it has been determined by careful engineering tests of many types of pasteurization equipment that it is easily possible to design and construct pasteurization equipment which does not require a temperature tolerance greater than  $1\frac{1}{2}^{\circ}$  F. The inclusion of this clause in the definition will support the health officer in resisting any pressure to induce him to accept a greater tolerance.

It may be advisable to explain for the lay reader the meaning of the term "temperature tolerance" as used in the definition. Explained in non-technical language, the phrase means that the health officer shall approve only apparatus which is so designed and constructed that when its indicating thermometer registers an "apparent" temperature of  $143\frac{1}{2}^{\circ}$  F., the lowest actual temperature of any particle of milk in the system will be not less than  $142^{\circ}$  F. In other words, the temperature tolerance is the maximum difference allowed



between what the thermometer leads one to believe is the temperature of the coldest drop of milk and the actual temperature of the coldest drop.

The term "combined holder and indicating thermometer temperature tolerance" is used because the  $1\frac{1}{2}^{\circ}$  F. tolerance is made up of an allowance of one degree for variations in actual temperature in the various corners and pockets of the holder system, plus a one-half degree allowance for deviations in the readings of individual satisfactory thermometers.

The fourth clause, "as shown by official tests with suitable testing equipment," is included in the definition in order to protect the health officer against any pressure to accept tests made by unofficial agencies such as the manufacturers, or private laboratories employed by the manufacturers, since in some cases such agencies might not be entirely unbiased.

"Official tests" should be interpreted to mean tests made by an official public health agency, that is, either by the city health department, the state health department, or by the U. S. Public Health Service. The term "suitable testing equipment" means testing equipment equal in performance to the thermocouple-potentiometer equipment used by the U. S. Public Health Service in its tests, with which it is possible to determine temperatures accurately in any portion of the holder system.

The fifth clause, "provided that such apparatus shall be operated as directed by the health officer," is included in the definition because even apparatus which is properly designed cannot be depended upon to pasteurize effectively unless properly operated.

Here again, just as in the case of design approval, it is recommended that the health officer's approval of the operation be based upon the provisions of the U. S. Public Health Service *Standard Milk Control Code*, since this will tend to promote standardization in operation requirements.

The details of both design and operation are incorporated in the *Standard Milk Control Code* rather than in the *Standard Ordinance* because their inclusion in the Ordinance would make this instrument unnecessarily long and greatly increase the cost of printing when enacted by municipalities. As it is, some small municipalities object to the present printing cost.

The sixth clause, "and so that the indicating thermometers and the recording thermometer charts both indicate a temperature of not less than  $143\frac{1}{2}^{\circ}$  F. continuously throughout the holding period," is incorporated in the definition in order to insure that even the coldest

particle of milk in the apparatus will have been held for 30 minutes at an actual temperature of at least  $142^{\circ}$  F. This will be true if the indicating thermometer indicates an "apparent" temperature of  $143\frac{1}{2}^{\circ}$  F. since the maximum temperature tolerance previously allowed in the design was fixed at  $1\frac{1}{2}^{\circ}$  F., and therefore the maximum temperature deviation in the system will be  $1\frac{1}{2}^{\circ}$  F. or less.

Not only the indicating thermometer, but also the recording thermometer chart, must show the required temperature for the full holding period, so that the health officer may assure himself that the required temperature is maintained for the proper length of time, not only when the inspector is present but also between inspections.

The question may be asked: What is to prevent the pasteurization plant from setting the recording thermometer so as to read a higher temperature than the indicating thermometer and thus delude the health officer?

The answer is that one of the detailed operation requirements given in the *Standard Milk Control Code* reads as follows:

The setting of recording thermometers shall be checked against the indicating thermometers daily by the plant operator and at least bi-weekly by the health officer, and shall be kept adjusted so as at no time to read higher than the indicating thermometer.

It will be apparent that the enforcement of the above requirement would soon result in the discovery by the health officer of any attempt to defraud by incorrectly setting the recording thermometer.

The seventh clause in the definition, "provided that nothing contained in this definition shall be construed as disbaring any other process which has been demonstrated as of at least equal efficiency, and is approved by the state health authority," has been included in the definition in order to prevent the definition from discouraging attempts to develop new and improved methods of pasteurization. It is conceivable, for example, that effective and practical methods of applying higher temperatures and shorter exposures may be developed and generally accepted by health authorities in the future. Unless this clause were included in the definition, it would be necessary to reword the definition in order to make the acceptance of such a method by the health officer legal. With the clause included it will be legal for any state health officer to admit other methods of pasteurization which may be demonstrated to him to be effective. As soon as such acceptance is general, the detailed requirements of the new method may be included in the definition.

Having now discussed the details of the definition of pasteuriza-

tion we may discuss the reasons the definition satisfies the three criterions previously given, namely:

1. That it is effective with respect to the killing of milk-borne pathogens.
2. That it is practical with respect to its enforcement by the health officer.
3. That it is practical with respect to its application by the dairy industry.

That the definition is effective with respect to the killing of milk-borne pathogens will have been clear from the detailed discussion already given.

That the definition is practical with respect to its enforcement by the health officer will be apparent when it is pointed out that the officer's duties are principally limited to the following:

1. He or his inspector must examine every pasteurization apparatus in use in the plants in his city and check the design characteristics against the design requirements listed in the *Standard Milk Control Code* with respect to thermometers, inlet and outlet valves, foam heating devices, vat and pocket covers, and holding time in the case of apparatus in which the holding time is automatically controlled.

2. He or his inspector must approve only such apparatus as meets these requirements and which has been found by his own tests or by those of the state health department or of the U. S. Public Health Service to show a deviation in temperature between the hottest and coldest particles of milk of not more than one degree Fahrenheit. (The U. S. Public Health Service is now preparing reports of tests on all widely used pasteurization apparatus.)

3. The indicating thermometer used must be checked against a standardized thermometer and show a deviation therefrom of not more than one-half degree Fahrenheit between 142° F. and 145° F.

4. The operation of each pasteurization apparatus must be inspected to see that it complies with the requirements listed in the *Standard Milk Control Code* as follows: (a) routine checking of the recording thermometers against the indicating thermometers; (b) the routine checking of the recording thermometer charts to see that none of the holding period sections of the curves shows a recorded temperature of less than 143½° F., and to see that each chart has inscribed upon it the reading of the indicating thermometer during a holding period, and the time at which the reading was taken; (c) the occasional inspection of all single vat installations which are not provided with leak protector valves to see that they are disconnected from the raw milk supply and from the outlet piping during the times required by the code; (d) the disinfection of outlet valves immediately prior to the discharge of pasteurized milk; (e) the proper use of foam heating devices; (f) the keeping closed of all vat and pocket covers during operation; (g) the pre-heating of all holders to at least the pasteurization temperature when required by the code.

It is believed that it is reasonable to state, therefore, that the "definition of pasteurization in the 1929 *Standard Ordinance and Code* is practical with respect to its enforcement by the health officer."

Finally, it is believed that the definition is practical with respect to its application by the dairy industry, because there is no requirement connected with it which is not easy to apply. Many pasteuriza-

tion plants located in cities enforcing the *Standard Milk Ordinance* are complying with the definition without difficulty. Furthermore, the principal objection to many present pasteurization definitions in the eyes of the industry has been avoided, namely the matter of cream line damage. There is no danger of damaging the cream line if the definition is intelligently applied by the pasteurization plant operator.

## DISCUSSION

### The Practical Aspects Concerned with Securing Enforcement of Suggested Definition for Pasteurization

GEORGE W. GRIM, V. M. D., F. A. P. H. A.

*Milk Control Officer, Milk Control District No. 1, Ardmore, Pa.*

THE proposed definition for pasteurization suggests a minimum heat treatment ( $142^{\circ}$  F. for 30 min.) to which every particle of milk must be subjected. It establishes a temperature tolerance of  $1^{\circ}$  F. to allow for what are described as reasonable variations in the milk when processed commercially in apparatus of approved type. An additional tolerance of  $\frac{1}{2}^{\circ}$  F. is established for acceptable inaccuracies of indicating thermometers. It is contemplated that the combined temperature tolerance of  $1\frac{1}{2}^{\circ}$  F. be added to the  $142^{\circ}$  F. minimum, operation to be of a character to insure that the indicating thermometer and the recording thermometer charts both show not less than  $143\frac{1}{2}^{\circ}$  F. continuously throughout the holding period.

Granted such operation, the control official is to assume that no particle of milk undergoing treatment will fall below  $142^{\circ}$  F. at any time during the 30-minute holding period; provided the process has been carried out in apparatus approved by the health officer and that such apparatus shall be operated as the health officer may direct.

The terms of the definition restrict the health officer from approving commercial pasteurizing apparatus in which the combined holder and indicating thermometer temperature variation is more than  $1\frac{1}{2}^{\circ}$  F. Temperature tolerances have been provided for recognized variations in the temperature of heated milk during the required holding period, resulting from imperfections inherent in apparatus of approved type, also for recognized inaccuracies of indicating thermometers, but not for recognized temperature variations always occurring during the course of ordinary milk plant operation, the result of reasonable and unavoidable deviations from any established procedure which the operator may endeavor to follow in the practical operation of commercial pasteurizing apparatus.

Safety margins, contained in pasteurizing definitions enforced during the past decade, were imposed, not primarily for the purpose of compensating for recognized defects current in pasteurizing apparatus, or for the purpose of compensating for inaccuracies of indicating thermometers, not required; but chiefly, for the purpose of compensating for recognized variations in the heat treatment of milk resulting from operation approximations of commercial practice. The proposed definition, while expressly recognizing the need for proper operation, fails to recognize any

need for this margin of safety. Accordingly, the health officer must expect to secure 100 per cent compliance upon the part of the milk plant in operating the pasteurizer as he may direct.

One must at once be impressed by the many new responsibilities to be assumed by the control official in the matter of pasteurizing equipment, particularly in the matter of the health officer placing his stamp of approval on the different pasteurizer designs, also the assumed responsibility of specifying precisely how apparatus should be operated to obtain a fixed result.

It would seem entirely agreeable to accept the proposed minimum heat treatment as effective for the destruction of milk-borne pathogens if actually applied to every particle of milk. To be effective, however, pasteurization must be conducted in proper apparatus under proper control. To be practical with respect to their application, the requirements must be such that the operator can carry them out in the course of ordinary milk plant operation.

To insure enforcement of that portion of the suggested definition which deals with approved apparatus it has been recommended that the control official's approval be based upon the design specifications prescribed in the *U. S. Standard Milk Code*. For the purpose of discussion let us assume that a certain pasteurizer has satisfied these design specifications. The health officer is then to place his approval upon the pasteurizer and permit its use, provided it is operated as directed by the control official. It now becomes the task of the health officer to direct the operation of the apparatus which he has approved in such manner that the variation in temperature between the hottest and coldest particles of milk undergoing treatment will never be greater than  $1^{\circ}$  F. In order that this requirement may be easily carried out by the control official he is again referred to the *Code* from which he is supposed to obtain information sufficient to direct the proper operation of a given design.

While it is contemplated that pasteurization shall be carried on only in apparatus of approved design, does it of necessity follow that such apparatus, when operated so that the recording thermometer charts indicate a temperature of not less than  $143\frac{1}{2}^{\circ}$  F. continuously throughout the holding period, actually applies at least  $142^{\circ}$  F. for at least 30 minutes to every particle of milk?

Assuming that apparatus approved upon the basis of the specifications of the *Code* has been operated as recommended—is the health officer justified in accepting a temperature tolerance of  $1\frac{1}{2}^{\circ}$  F. as sufficient to insure the heating of every particle of milk to at least  $142^{\circ}$  F. for 30 minutes?

Whether effective pasteurization would result from the application in the field of the suggested definition, and whether the definition is practical with respect to its enforcement by the health official and with respect to its application by the dairy industry, are questions which must be answered—from our experiences in the supervision of the pasteurization process, from an examination of apparatus now in use in the majority of our plants, and from an examination of the design and operating specifications of the *Standard Milk Code* which the U. S. Public Health Service recommends to health officers for use as a text in approving and directing the operation of the various pasteurizers.

Under "Design specifications to be met in order to secure health officer's approval" we find rather specific instructions concerning acceptable locations for the various types of thermometers required on pasteurizing apparatus. Much space is given to specifications to be followed by manufacturers in the construction of thermometers for use by the dairy industry and the control official. With slight ex-

ceptions, the only references in the *Code* concerning design specifications of the pasteurizer which the health officer is to approve concern themselves with the character of valves through which the milk enters or discharges, and the pasteurizer lids or covers.

Aside from the requirement that reasonably accurate and easily readable thermometers be used to indicate and record the temperature of milk undergoing treatment, the thermometer specifications have little value other than tending to standardize types of thermometers used for pasteurization. On the other hand, the design specifications, if followed by the health officer, would result in his approving of the use of apparatus not designed to furnish a record of the full heat treatment applied to the milk. Strict interpretation of present pasteurization definitions does not permit the operation of apparatus without recording upon a chart the full heat treatment applied. While most health departments have in the past failed to enforce the provisions relating to temperature records of milk in holders supplied at the pasteurizing temperature, it is considered entirely practical to obtain such records in every design of pasteurizer now in use, with the possible exception of one. Therefore, with respect to location of thermometers the control official should consider the design specifications applicable to vat, pocket or continuous flow installations into which milk passes at pasteurization temperature inadequate, because they fail to require any record of the full heat treatment applied in three of the four types of equipment mentioned in the *Code*, namely vat, pocket and continuous flow, into which milk passes at pasteurizing temperature. The control official should most emphatically refuse to approve any and all designs of apparatus not equipped to furnish a satisfactory record of the full heat treatment applied in an endeavor to effect pasteurization.

A record of the full heat treatment applied in holders supplied at the pasteurizing temperature is essential to the control official for the following reasons:

1. To aid in determining whether each pocket of holder was pre-heated to at least the pasteurizing temperature immediately before the milk was passed into the apparatus.
2. To indicate effectiveness of device for heating air in holder above the milk.
3. To show cold air leakage into holder particularly during interval between emptying and filling.
4. To record holding time and temperature of milk in each individual pocket of holder. (Temperature reductions occasionally occur during unavoidable shut-downs in milk plant operation. Were the control official to base his approval of apparatus on the design specifications recommended by the U. S. Public Health Service *Milk Code* there would be no record of supposedly pasteurized milk that had fallen below the minimum temperature from some cause and which had been raised to the pasteurizing temperature in the holder just before the operator permitted it to pass over the thermometer bulb located in the outlet manifold.)
5. To record variations in temperature of milk in pockets caused by variations in temperature of water used in maintaining temperature of apparatus.
6. To comply with paragraph I, Item B of suggested code: "The pasteurization equipment shall be operated so that the indicating thermometer and the recording thermometer charts both read at least the temperature which the definition of pasteurization requires the thermometers to show continuously through the holding period."

The specifications concerning location of thermometer fittings "to conform to that of standard International Association Milk Dealers wall type fitting" should

be objected to. Why should the International Association of Milk Dealers be authorized by the health department to designate location of seat of indicating thermometer in "batch type pasteurizer"?

#### MAINTAINING MINIMUM HOLDING PERIOD

The design specification in the *Code* under the above heading would specifically authorize the dairy industry to operate holders equipped with automatic, controlled effluent and affluent valves in such a way that the control official would have absolutely no record of the time period the milk was held, its temperature during the holding period or the interval of lapsed time between the opening and closing of such automatic valves.

In lieu of recorded holding time the *Code* suggests that the control official accept certain design and operation conditions which he may prescribe and require in the case of automatically timed pocket type or continuous flow holders. In my opinion it is just as essential to have a full record of the heat treatment applied to milk passing through a continuous flow holder as it is to have a similar record for a single manually operated vat installation. In the case of the manually operated vat the *Code* demands a record and goes into detail to explain how the control official should read the chart in order to approximate the holding time applied. In the case of the flow holder the *Code* merely requires that the control official test the holder when installed, following repairs or alterations, see that it has an apparent holding time of 31 minutes, and satisfy himself that its construction and operation will insure proper holding of the milk. I am amazed that such a procedure should be considered adequate and that having followed it, health officers of this country should be urged to approve apparatus of this type. Almost while your back is turned the operator can increase the rate of flow of milk through such holders more than 30 per cent with no record left of his manipulations. That such increases in rate of flow are common in the operation of milk plants at present may be illustrated upon charts made by a speed recorder installed upon a milk pump supplying milk to a continuous flow holder. Figure I illustrates that during a single day's run three changes were made of a small pinion gear resulting in increasing the speed of the pump supplying milk to the holder to a point considered well beyond the legal holding capacity of the apparatus.

The control official will do well to consider any pasteurizer not equipped to give a record from which he may at least approximate the minimum holding period of milk undergoing treatment potentially dangerous and beyond the scope of his control. Therefore, before any serious consideration should be given to the matter of accepting even tentatively a holder of the flow type proper records to indicate the rate of operation should be demanded and obtained by the control official. It is entirely practical to make such records in the course of milk plant operation. I would refuse in the interests of the milk consuming public either to approve or to accept pasteurizing equipment meeting fully the design specifications of the *Code* as they apply to holders of this type.

In the case of automatically operated valves of pocket type holders a record of opening and closing of the valves should be required before acceptance is granted.

#### INLET AND OUTLET VALVES

The design specifications of the *Code* recommend the acceptance of valves with pockets and suggest overcoming this defect by continuous steaming. The control

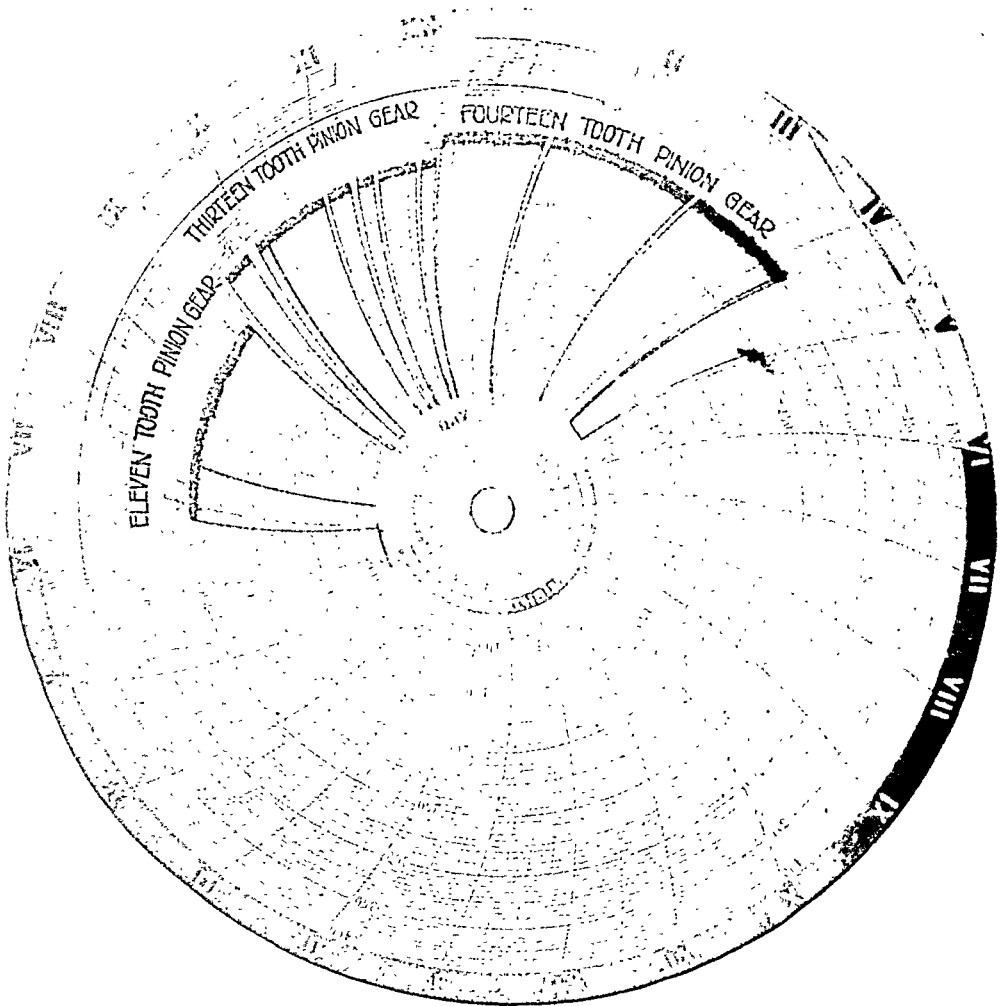


FIGURE I—Reproduction of graph made by speed recorder designed to record rate of operation. The graph indicates three recorded increases in speed of pump supplying milk to holder. The increases in speed of the milk pump have been produced by changing a pinion gear attached to the shaft of the motor driving the pump. By replacing one pinion gear with another the presumed 30-minute holding period is materially shortened. The graph made by the pen falling toward the center of the chart evidences the frequency and duration of shutdowns occurring during the course of a single day's operation. Except for a few isolated instances, recording devices capable of making records, as shown in Figure I, have not been used as an aid in controlling the pasteurizing process.

official should refuse to accept such non-flush type valves because experience has already proved the requirement for continuous or automatic steaming not practical with respect to its application by the dairy industry. Steam pressures, particularly in small plants, where such valves are most frequently met with, are subject to extreme variation and cannot, under the varied conditions of milk plant operation, be depended upon to keep milk contained in such pockets at the pasteurization temperature. It is entirely practical for the industry to supply pasteurizers with valves which do not have to be steamed continuously. The operating specifications relative to valves require automatic steaming of valves, just prior to the discharge of



milk, in all types except single vat installations. From my own experience and observation in cities reputed to have succeeded in eliminating defects current in pasteurization apparatus I am convinced that attempts at automatic steaming of valves have in many instances resulted in failures even to heat the valve which was supposed to be automatically steamed. The problem of water-logged steam lines, resulting from steam trap and boiler deficiencies, has rendered many attempts at automatic steaming wholly worthless. Therefore I would recommend that the health officer refrain from considering satisfactory past effort to sterilize outlet valves by automatic steaming. The manufacturers should be urged to provide more dependable methods for accomplishing the desired result. For the present disconnecting the outlet valve and sterilizing by heat manually appears most dependable.

#### FOAM HEATING

In order that any differences between the temperature of foam and that of milk beneath might be kept within the 1° F. tolerance established for the apparatus by the definition, the *Code* provides that if foam is present the atmosphere above milk shall be kept at pasteurization temperature. Exactly how the health officer is to accomplish this is not clear. The admission of steam into the air space beneath the lids is suggested. There is a statement about using a steam trap properly designed to avoid the discharge of water into the milk. So far as I have been able to learn all steam traps are so designed, but none that I have ever used or observed avoided the discharge of water into the milk at certain times during the varied conditions which present themselves in the usual course of milk plant operation. It is difficult to understand how this feature of the foam heating problem could be classed by Mr. Frank in the category of requirements "easy to apply."

I have often tried to heat foam and to maintain proper pasteurization temperature in it. Foam may occur at any time in any type of holder, so all types must be designed to cope with it. Milk foam is an extremely peculiar and elusive substance. At one season there may be none; at another much. Today it may be low and fine in texture, tomorrow upstanding and coarse. I have never succeeded in maintaining foam temperatures at a point equal to the milk throughout the day's run. I consider satisfactory heating of foam the most difficult problem to overcome in eliminating defects of pasteurization apparatus. Certainly we have not yet progressed to the point where every particle of foam in the various types of apparatus, entitled to approval under the design specifications of the *Code*, is maintained at a minimum of 142° F. when the indicating thermometer indicates 143½° F. On the contrary, the practical application of pasteurization commercially even in plants of the better type is such that foam temperatures are frequently 10 or 15° F. below those of the milk as indicated by the recording thermometer. From a practical standpoint it might be stated that efforts to maintain satisfactory temperature of foam have not yet commenced. Except for an extremely small number of large automatic vat or pocket type holders of modern design, practically no effort is being made by pasteurizing plants either to heat foam or maintain the temperature of the air above the milk at a point equal to the milk. Therefore, data are not yet available upon which to base a conclusion that a definition for pasteurization which establishes a temperature tolerance of but 1° F. and exacts 100 per cent compliance in adhering to operating directions is practicable either with respect to its enforcement by the health officer or its application by the dairy industry.

## VAT OR POCKET COVERS

The *Code* sets forth design specifications calculated to prevent anything from falling into the vat in either the open or closed position. It appears that an important point has been overlooked here—that of requiring the lids to be “tight fitting and properly insulated.”

## PREHEATING OF HOLDERS

The *Code* is not clear concerning how preheating is to be accomplished. Many holders are not provided with independent means of temperature maintenance. Vat or pocket type pasteurizers are frequently insulated with cork and unless sufficient heat is supplied to such apparatus at the commencement of the day's run, temperature balance of the holder will not be acquired from the heat supplied to the milk. This fact is recognized by the *Code*, which suggests as a remedy the heating of the apparatus by steam or otherwise before the holding period begins. I do not consider it either proper or safe to accept or approve any holder which receives the milk at the pasteurization temperature unless such holder is so constructed that the temperature of the pockets can be brought to the pasteurization temperature—and that such fact be registered upon recording thermometers installed upon each pocket—before the heated milk is passed into them. If satisfactory temperatures cannot be obtained before the milk enters, final heating should be effected in the holder. I should also require in this type of holder that means be provided in each pocket to raise the temperature of the milk in the event of mishaps, such as heater failure or shutdowns, resulting in milk falling below pasteurization temperature.

## OPERATION SPECIFICATIONS

One of the most notable requirements of the proposed definition is the clause, “provided that such apparatus shall be operated as directed by the health officer.” Mr. Frank suggests that the health officer's approval of operation be based upon the provisions of the U. S. Public Health Service *Standard Milk Code*. Design approval is limited to apparatus which requires a holding temperature tolerance of not more than 1° F. How is the control official to direct such operations? The *Code* does not begin to tell him how to operate commercial apparatus so that temperature variations during operation, day after day, will be not more than 1°. In the practical application of heat to milk under commercial conditions we simply do not have plants capable of sustained operation within the narrow limits of 1° F., and neither this nor any other definition for pasteurization will provide them.

The best that can be hoped for is to select, after careful study has been made of the various types of equipment, under the varied conditions of milk plant operation, some reasonable temperature margin to be added to a temperature margin necessitated by unavoidable variations resulting both from imperfections in thermometers and apparatus, the sum to represent a safety margin necessary to compensate for the uncontrollable and varied fluctuation in ordinary milk plant practice. That Mr. Frank himself realized this is clear from a paper he presented at the Buffalo meeting of this Association: “That a proper definition of pasteurization will be one which applies to every particle of milk pasteurized and which requires in addition a margin of safety for the design and operation approximations of commercial practice.”

I submit that absolutely no margin of safety to cover operation approximation of commercial practice has been included in the definition suggested here.

I submit further that commercial pasteurization plants of the present day cannot begin to operate within the narrow limits of  $1^{\circ}$  F. as a maximum under the varied conditions they are called upon to meet.

The conclusion drawn that the suggested definition for pasteurization is practical with respect to its enforcement by health officers and with respect to its application by the dairy industry is without a sound basis and misleading.

It has not been shown by data or otherwise that a combined temperature and indicating thermometer tolerance of  $1\frac{1}{2}^{\circ}$  F. will insure the heating of every particle of milk to at least  $142^{\circ}$  F. in the various described approved designs of pasteurizing apparatus, nor that ordinary commercial pasteurizing apparatus can be successfully operated within the range of the tolerance suggested.

It has not been shown that the requirements exacted by the proposed definition are practical with respect to their application by the dairy industry, nor their enforcement by the health official, nor that they are *easy to apply*.

A proper definition of pasteurization will be one that provides a satisfactory margin of safety to compensate for reasonable design imperfections of apparatus, inaccuracies of thermometers and for reasonable and unavoidable variations resulting from operating approximations of commercial practice. An extensive study of the variable conditions in average milk plants likely to affect operation of the various types of pasteurizing apparatus is necessary to establish a basis for a temperature margin to compensate for reasonable operating approximations of commercial practice. Extensive studies, with the publication of data showing temperature variations of milk, foam and air in the various designs of pasteurizing apparatus are necessary for the same reason. Pending the publication and acceptance of results of such studies it is suggested that the health officials require that milk sold as pasteurized be heated for 30 minutes at a temperature of  $145^{\circ}$  F.

### CLOSING REMARKS

LESLIE C. FRANK, C. E.

IT should be noted that Dr. Grim's criticisms are directed largely at the design and operation specifications for pasteurization machinery contained in the *Standard Milk Control Code*, rather than at the definition of pasteurization itself.

1. The only one of Dr. Grim's criticisms which is directed at the definition itself is that it does not contain an adequate margin of safety to cover design and operation deviations of commercial practice.

The margin of safety embodied in the definition is the difference between the required temperature of  $143\frac{1}{2}^{\circ}$  F. and the lethal limit for milk-borne pathogens. Most authorities agree upon  $140^{\circ}$  F. as the lethal limit when a time of 30 minutes is used. One and one-half degrees of the  $3\frac{1}{2}^{\circ}$  margin is intended by the definition as a *design* tolerance, and the definition requires that the health officer shall not approve any apparatus which shows a temperature deviation greater than  $1\frac{1}{2}^{\circ}$  when properly operated. The researches of the U. S. Public Health Service indicate that properly designed machinery can easily meet this requirement.

As to an *operation* margin or tolerance I have come to the conclusion that such a tolerance is illogical and dangerous. Every plant should be required to comply strictly with the  $143\frac{1}{2}^{\circ}$  F. minimum, all operation deviations to be *above* this temperature, and the plant should be punished by de-grading or revocation of permit whenever it fails to comply. Dr. Grim suggests  $145^{\circ}$  F., and it is assumed that he means this temperature to be one at which the operator will *aim*, and *above and*

below which the operation deviations will occur. As a matter of fact, a definition of  $143\frac{1}{2}^{\circ}$  F. which is rigidly enforced as a *minimum* will result in a higher actual temperature than a definition of  $145^{\circ}$  F. which is *aimed at* by the operator, but which is deliberately assumed to allow for operation deviations of unknown magnitude.

As before stated, Dr. Grim's remaining criticisms deal with the machinery specifications and not with the definition. They are very briefly discussed below:

2. Dr. Grim objects to the fact that the *Standard Milk Control Code* does not require any record of the holding time in automatically timed holders. He states that this would make it possible for the plant operator to delude the health officer by changing a pinion gear, for example, in order to change the time. May I point out that no definition, not even the  $145^{\circ}$  F. definition suggested by Dr. Grim, will prevent fraud. Fraud must be overcome by inspection and by a proper, wholesome relationship between the inspector and the plant. It cannot be overcome by changes in the definition or in the specifications. If properly designed, automatically timed pasteurizers are not fraudulently tampered with, the milk will automatically and dependably be held for the proper time. The addition of time recorders will merely result in transferring the fraudulent intent from the pinion gear to the time recorder.

3. Dr. Grim further objects to the fact that the *Standard Milk Control Code* does not require flush type valves where the outlet valves are coupled close to the holder and continuously heated. He criticizes the practice of valve steaming because he has noted imperfect compliance in several instances. It is emphasized that the faulty instances he reports should not be permitted to discredit successful practice. There is no sound engineering reason why steam cannot be forced continuously through a steam port in a valve.

4. Dr. Grim's third criticism is that the *Code* requires automatically operated valves to be disinfected automatically, which he disapproves. He states that he has observed several instances of improper compliance with this requirement. Here again there is no sound engineering reason why steam cannot be automatically admitted to valves which open and close automatically and we should not allow ourselves to be misled into changing this item merely because certain plants have been observed to be improperly carrying it out.

5. Dr. Grim further criticizes the *Standard Milk Control Code* because he believes its requirement that the air above the milk surfaces shall be kept at or above the pasteurization temperature in order that any milk foam may be kept at or above the pasteurization temperature, cannot be accomplished, and that when it is attempted to heat the air by admitting live steam, water of condensation will be added to the milk, to which he objects.

The U. S. Public Health Service has experimented with several methods of heating the air above the foam. It has been impossible to secure satisfactory results by dry-heating the air, but the admission of wet steam directly to the air itself has given satisfactory results. It is possible that the unsuccessful results reported by Dr. Grim were in connection with attempts to use the dry-air method. His objections to the use of steam on the score that water of condensation will enter the milk is not considered sound. Even if the water trap were to fail utterly the result would only be a fraction of a thimblefull of water of condensation to each pint of milk. The sensible milk consumer would immediately prefer this negligible amount of water of condensation to the alternative of improper pasteurization.

6. Dr. Grim objects that the *Code* does not require the covers of vats and pockets to be insulated. The September, 1929, issue of the *Code*, which appeared several weeks before his discussion, makes this requirement.

7. Dr. Grim's objection that the covers are not required to be tight-fitting is considered to be indefinite. A requirement of hermetic sealing would be impracticable and it would seem that any other interpretation of "tight fitting" is satisfied by the requirement of the *Code* that the covers of vats be so constructed that nothing on top thereof will drop into the vat in either its open or closed position and that the covers of all equipment must be insulated and kept closed except in case of emergency.

8. Dr. Grim considers inadequate the requirement of the *Code* that certain types of holders shall be pre-heated with steam or otherwise so that the metal shall be at least at the pasteurization temperature before the holding period begins, because the requirement does not state how such pre-heating shall be accomplished. It is certain that it *can* be accomplished inasmuch as it is done every time the apparatus is sterilized by means of heat. It is believed that the *exact* method selected should be left to the operator.

9. Dr. Grim's next objection to the *Standard Milk Control Code* is that it does not require independent recording thermometers for each pocket of multiple pocket holders. He deems these necessary in order that a record may be had of the fact that the holder has been pre-heated. The *Code* now requires a recording thermometer in the outlet piping to which all of the pockets feed, and if pre-heating is not properly done the first milk temperature shown by the outlet recorder will be less than the required temperature, which will be sufficient evidence.

10. Dr. Grim's next objection is that the *Standard Milk Control Code* does not require each pocket to be equipped with independent heating means, which he thinks should be provided in order to prevent inadequately heated milk from reaching the cooler following heater failures or shut-downs. This is considered an unnecessarily complicated means of achieving an object which can be achieved by any one of three methods, an example of which is the automatic return-flow valve, which is more positive than Dr. Grim's suggestion. It should be noted that the object itself, which it is desired to achieve, is made mandatory by the *Code*.

#### FOUR WEEKS TO GET A NEW MEMBER!

SEPTEMBER 15 TO OCTOBER 13

*During four weeks, September 15–October 13, members of the A. P. H. A. are being offered the opportunity to help strengthen their Association by bringing in new members.*

*Members joining during this drive will receive the magazine free during November and December.*

*The names of those who send in one new member each will be posted at the Fort Worth meeting and printed in the American Journal of Public Health. Those sending in more than one member will receive special mention.*

*What are you doing to coöperate with the Association in this effort?*

## EDITORIAL SECTION

*Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.*

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## COMMERCIAL COOPERATION AND PUBLIC HEALTH

ONE of the opportunities easily available to health workers and of which too few take advantage is the coöperation that ethical commercial organizations offer for the furtherance of their public health programs.

Some of the best pieces of health education work in the United States are being done by commercial concerns. Many of them maintain expensive laboratories, in charge of scientists of high standing, which are constantly experimenting and adding to our knowledge of nutrition, milk sanitation, water purification, communicable disease control, and all of the branches of sanitary science.

There is hardly a problem that can be brought forth that some commercial house of sound reputation has not worked on and produced results, if not conclusive, at least suggestive.

Delegates to the Fort Worth Annual Meeting of the American Public Health Association will see an exhibit there in which fifty or more such organizations are participating. There is much to see and to learn in that exhibit. Their annual appearances at meetings of the American Public Health Association are regarded by most houses as the time to present new products, new services, new discoveries. The men and women in charge of the exhibits are trained workers, many of them recruited from the professional public health field and Association members of long standing. From the background of their own experience, they know public health and the application to it of the equipment and products they are exhibiting.

Every delegate to Fort Worth should plan his schedule so that

ample time is provided to study the exhibits and to make the acquaintance of the exhibitors. It would be wise to miss a paper now and then if necessary. This first-hand knowledge of what commercial organizations are doing to make our work easier or more effective will be valuable out of all proportion to the time spent in acquiring it.

## GLUCOSE ("CORN SUGAR," SO-CALLED) IN FOODS UNDECLARED ON LABELS

THE recent attempts of certain interests to break down the effective enforcement of pure food laws by legislation in Congress having completely failed, these interests are again resorting to measures that smack of insincerity. This time it is the plan to accomplish their object by an administrative decision from the Secretary of Agriculture, in the guise of an economic farm relief measure.

The manufacturers of prepared foods have found great inspiration in the enforcement of the food and drug laws. The purposes of such laws are primarily to protect the interests of consumers, and, in their interest, to prevent deception and fraud in the sale of food.

The enforcement of food laws has resulted in a greatly increased consumers' confidence in the prepared foods shipped in interstate commerce and sold in our markets. The laws forbid, among other things, the labeling of foods in a manner whereby consumers may be deceived.

It has always been held that any added sweetness imparted to foods, in their manufacture, is understood by consumers to be due to sucrose (common sugar), and that any substitute used in the place of sucrose should be declared on the label.

Corn sugar is recognized as a wholesome product and its use in the manufacture of foods is now permitted, and has always been permitted, when used in such a manner that it would not work deception on the consumer.

However, corn sugar is distinctly different from sucrose. It is much less soluble; it is only about half as sweet; and it has distinctly different properties from those of sucrose when used in the manufacture of many foods.

In recent years we have learned much of the value of broadcasting facts concerning the diet in preventing deficiency diseases and thus promoting public health. Prepared foods make seasonal products available throughout the year and their effect in broadening the diet cannot be overestimated. Any decision which would weaken public confidence in prepared food would undoubtedly reduce consumption of such foods.

In recent years the manufacturers of this product have sought to influence the agricultural interests of the west by claiming that corn sugar is equally as suitable as cane or beet sugar in the manufacture of foods and might largely, or perhaps entirely, replace common sugar for this purpose. They have made exaggerated statements regarding the amount of corn sugar that might be used in foods and the amount of corn that might therefore be consumed in its manufacture.

This question is not a new one. It is merely another phase of the glucose or corn syrup question which has been before Congress and departments from the time the food and drugs act was passed.

The corn products manufacturers, who alone desire this change, opposed the enactment of the food and drugs act and since that time have sought by every means within their power to have their products used in a way that would deceive consumers.

The food laws of the country today are not economic measures, and should not be considered in that light. They are consumers' measures that simply inspire honest manufacture, fair trade and a square deal to the consumer.

This entering wedge in the pure food law, that would pave the way for all kinds of rulings or legislation that would, in the end, make possible wholesale adulteration and bring back the disgraceful condition that existed prior to 1906, should not be permitted.

Corn sugar, so-called, if all that its proponents claim for it, should be unafraid of making its presence known on labels.

The consumers' present confidence in food law requirement should be continued rather than substitute a policy of "Let the Buyer Beware."

### THE LÜBECK AFFAIR

**D**URING April, 1930, some 246 infants were vaccinated with BCG, the stock cultures of which are said to have been bought in Paris and the sub-cultures made by Dr. Deycke of Lübeck, an experienced immunologist. Fifty of the children soon became severely ill with enlarged inguinal and abdominal glands and showed other symptoms of acute tuberculosis. At present, according to the latest figures available, 46 deaths have occurred while 68 children are gravely ill. Criminal proceedings have been instituted against the medical director of the Lübeck Health Office and the chief physicians of the State Hospital and the Children's Hospital.

This deplorable disaster has raised a number of questions and will doubtless give material for the antis to work on. The German health office has sent Professor Lange to investigate, while Professor Dryer



and Captain Douglas have been sent by the Medical Research Council from England. Unquestionably other investigations will also be made. Professor Calmette states correctly that no such accidents have followed the extensive use of BCG in France and other countries.

The vaccine has been studied by many bacteriologists and clinicians, and the general opinion is that it is innocuous and cannot produce active tuberculous lesions. Upon the other hand, two American workers, Petroff of the Saranac Lake Laboratory, and Watson of Canada, have found that it does sometimes cause tuberculous changes. Petroff, by the method of dissociation, was able to separate the vaccine into two types, one of which was virulent for guinea pigs while the other produced lesions which healed. Others have failed to confirm these results. Under Park, of New York, the vaccine has been used with apparently excellent results. It will be remembered that the late Dr. Trudeau held that a living culture was necessary to produce immunity against tuberculosis, and he was followed in this belief by many others. In recent years the trend has been toward killed organisms for all vaccines and ample experience has demonstrated the success of this method in such diseases as plague and typhoid fever.

Whatever may have been the cause of the illnesses and deaths in the Lübeck case it should not deter us from further studies of immunization against tuberculosis. A scourge which destroys so many lives annually in practically every part of the world demands our utmost endeavors. No one would think of abandoning the use of morphine, for example, because it has often produced death. Without doubt, the cause of the accident will be determined by the investigations under way, and the use of this vaccine, or some other, will be made safer on account of the studies brought about by this accident.

However, it must always be borne in mind that the manufacture of biological products requires the highest technical skill, and their administration should be always by, or under the direct supervision of, physicians. In the Lübeck case, it is said that the vaccine was given outside of the hospitals and by midwives.

### THE EPIDEMIOLOGY OF TYPHUS

THE recent report by Dr. William Fletcher<sup>1</sup> of his researches into the nature of typhus-like diseases that occur in the Malay States has stirred up again the controversy of how typhus fever may be distinguished as a pathological and epidemiological entity. It is rather surprising to note Dr. Fletcher's insistence that a fever must not be called "typhus"—"the public will not allow these diseases to be called typhus"—because quarantine is unnecessary.

It is surely admitted that the real quarantine in the case of European *Typhus exanthematicus* is directed more against the louse than against the virus of typhus itself. It is at least doubtful whether the "sanitary cordon" drawn around Poland after the war was as important as the habits of cleanliness of the people living on this side of the frontier in preventing the development of a pandemic of typhus fever.

If a disease is carried by different vectors in different parts of the world, does it thereby become a different disease either pathologically or epidemiologically? Surely not! Neither should the mildness of the attack in sporadic cases of "typhus-like diseases" excuse them from being called "typhus."

A recently published letter of the Health Commissioner of Virginia<sup>1</sup> states that there were in 1929 21 cases of "typhus fever" in the State of Virginia, most of them quite severe and 7 of them fatal. The attempt to label smallpox as "alastrim" did not prevent it, either, from reverting occasionally to its virulent form.

Maxcy and Mooser have shown that the virus from endemic typhus can be propagated in the louse and that, under these circumstances, *R. prowazeki* appear in the guts of these insects. This evidence, coupled with the evidence for the development of cross-immunity in animals, fully justifies Williams in speaking of the sporadic form of the disease in his state frankly as typhus fever.

It is perhaps not without significance that endemic typhus is not reported from the Mountain states, and that on the other hand a disease that is clinically and pathologically indistinguishable from typhus is reported from this region. It is true that the vector *Dermacentor Andersoni*, the Rocky Mountain tick, is not associated with typhus in other parts of the world. Again we would emphasize that a disease is not characterized by its vector. If ticks were as abundant upon the bodies of Coloradans as lice are upon the peasants of Russia, Rocky Mountain fever would almost certainly become an epidemic disease. In the meantime the same methods of experimentation may be applied here as in the case of the endemic typhus of the South. Not only the frank exanthematic form should be investigated, but also those milder forms recently described by Becker<sup>2</sup> in which a positive Weil-Felix test is found but no exanthem. If and when the evidence is as effective as is now the case for Brill's disease, the name "Rocky Mountain fever" should be discontinued and typhus should reign in its stead.

#### REFERENCES

1. Fletcher, William. Typhus-like Fevers of Unknown Etiology, with Special Reference to the Malay States, *Proc. Roy. Soc. Med.*, 23: 1021 (May), 1930.
2. Williams, Ennion G. Endemic Typhus (Brill's Disease), *Virginia Med. Month.*, 57: 183 (June), 1930.
3. Becker, Frederick E. Tick-Borne Infections in Colorado. II. A Survey of the Infections Transmitted by the Wood Tick, *Colo. Med.*, 27: 87 (Mar.), 1930.

# THE PUBLIC HEALTH DEPARTMENT IN MEXICO CITY

F. P. MIRANDA, M. D.

*Director, Interchange Office, Department of Health, Mexico City, Mexico*

ON November 20, 1929, nineteen years after the initiation of the Mexican Revolution, President Emilio Portes-Gil dedicated the splendid new health department building erected in Mexico City as a symbol of the spirit of social betterment dominating the activities of our generation.

From the intense sufferings and hardships of the prolonged period of political agitation, new thoughts and inspirations have arisen, suggestive of redemption and even rebirth of a nation which has wonderful possibilities for the future.

Mexico represents the fusion of two civilizations and of two races. Following economic and social laws, the more advanced European civilization would either destroy the other or submit it to a domination which would practically amount to slavery. The Christian ideals and practices of the missionaries did much to smooth the practices of the "economic man" but notwithstanding, the great majority of the Indian population remained as a very low wage earning group, unable to raise its standards of life and to enjoy the benefits of a civilization which only tended to make it more miserable and hopeless.

The problem of public health in Mexico could not be solved as an independent problem. It had to be worked into a vast scheme of development mostly economic and educational. It was for this reason that the Mexican Constitution of 1917 converted the old Board of Health of Mexico City into a Federal Department with enlarged powers, placing under its jurisdiction all matters relating to transmissible diseases, aiming to end the incompetency and failure characteristic of local management.

The enlargement of powers was slowly effected as the economic resources of the Federal Government developed. It was not until the years 1926-1927 that Federal Offices of Health were opened in all the States of the Union.

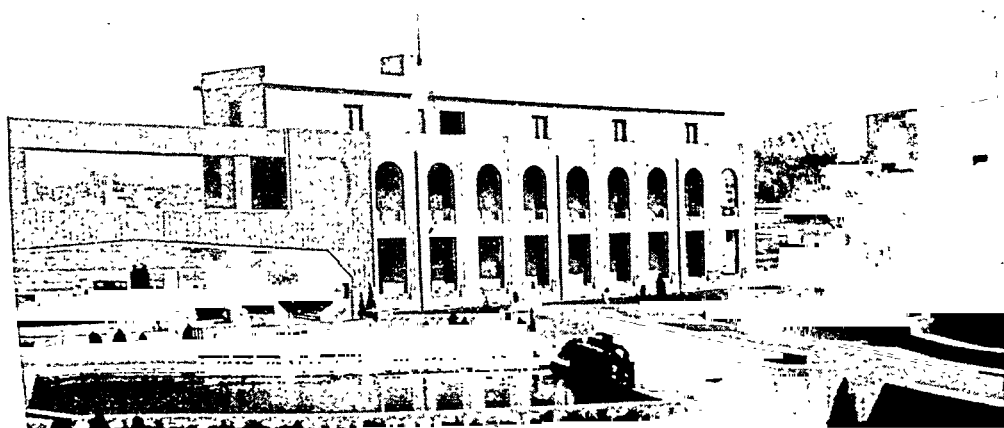
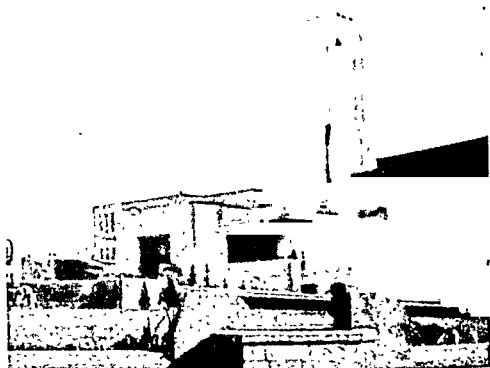
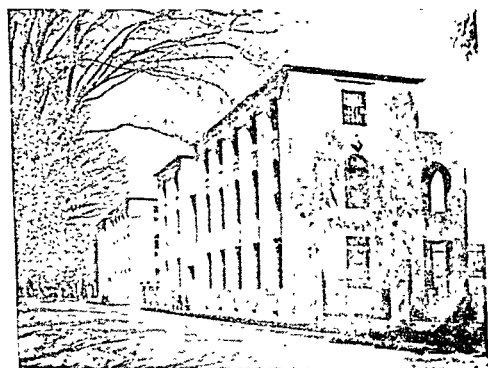


*F. P. Miranda, M.D.*

At this time a plan was evolved for the construction of a suitable building large enough to provide convenient quarters for the administrative and technical staff of the department.

Architect Carlos Obregón Santacilia was chosen by Dr. Bernardo J. Gastélum, who was at that time in charge of the Department, and work was begun immediately.

The architect had in mind an imposing building, worthy of the paramount importance that the affairs of public health have in this age, and from the artistic standpoint he sought to har-



*Views of Headquarters of the Department of Health, Mexico City, Mexico*

monize the severe and simple lines of the architecture of today with the models left to us from the old Aztec art.

As he himself said:



*Ulises Valdez, M.D.*  
*Secretary General, Department of Health*

The arrangement of the building is that emanating from the needs and functions of each of the branches that form the Department of Health, and as to style, I made the only thing that could be made (we are in Mexico and in 1929), using the marvelous materials given by our soil, arranging the departments of the building as our climatological conditions demand, and combining the materials used with the natural simplicity of a functional organism . . . with architectural forms, which result from a constant purification, far from the influence of the old styles that have no reason to exist in our times and our surroundings and which could not agree with the needs of today; in this way, without the bounds of prejudice, I conceived a building in which the light and the air would be its chief ornaments and in which the arrangement of the departments would ease its functions. I have tried to evolve a Mexican style of our day, thinking as if our marvelous ancient civilization would not have been retained and as if our traditions would have continued uninterrupted until our day.

It may be well to explain to those un-

familiar with the climate of Mexico City the great importance of this basis in our architecture.

Mexico City is situated at an altitude of 7,350 feet above sea level. The air is correspondingly light, having a pressure of 585 mm. and a low conductive capacity for heat. This means that we depend more on the sun for our heating, and need a larger space for air. These facts together with the softness of our soil, that precludes the erection of any skyscrapers, are the reason for our preference for low-ample buildings provided with large courts or "patios" which admit air and sun as a basis for health. Fortunately our sun rarely hides itself beneath clouds or fogs, and thus we enjoy an exceptional, even climate all the year round without extremes of temperature.

The building may be divided into six masses composed of three floors each, two of which are central and four are lateral and all of them surrounding the "patio" in which the waters of a large fountain serve as a reflecting glass for the beauty of the structures.

The main central mass contains the head offices, and the back central lodge the central laboratories for analysis of foods and drugs.

The lateral masses are occupied by the departments which we call "Services," namely: Transmissible Diseases, Engineering, Foods, Drugs and Chemistry, Public Health Education, and Vital Statistics.

In addition, place was provided for our printing plant and library. A notable feature of the building is the mural decoration in the main council room. These representations of massive figures suggesting the ideal of hygiene were done by Sr. Diego Rivera.

Above the imposing stairways two stone sculptures, one of Dr. Eduardo Liceaga, a pioneer in hygiene, and a past president of the American Public

Health Association, the other of Dr. Gaviño Iglesias, a pioneer in bacteriology, remind us of our past struggles and give us an inspiration for the future.

We sincerely hope that the visit of our American colleagues to this building may serve as a still further inspiration for our work and aims.

## REAL WESTERN ENTERTAINMENT AT FORT WORTH CONVENTION

DR. TRUMAN TERRELL

*Chairman, Entertainment Committee, Fort Worth, Texas*

A GLIMPSE of the West of the olden days, the West that is so rapidly passing, will be offered to visitors to the American Public Health convention at Fort Worth. The features of this entertainment will be a real western rodeo, such as can be produced only in the ranch country, and an old-fashioned southern barbecue. Fort Worth, "where Golden West and Sunny Southland meet," is enabled to offer both.

The rodeo will be staged in the great coliseum on the grounds of the Southwestern Exposition and Fat Stock Show, where Fort Worth's big livestock show and rodeo are held each March. The barbecue will be served in one of the exposition buildings preceding the rodeo on the evening of Tuesday, October 28.

Buck Lucas, former world's champion all-round cowboy, will direct the rodeo. The performers will include a number of the best known rodeo stars in the world, among whom are Leonard Ward, Rube Roberts, Mike Hastings, Oklahoma Curly, Leonard Stroud, Warren Farmer, Indian Joe, Jim Massey, Buck Stewart and others. Women performers will include such stars as Fox Hastings, Tad Lucas, Ruth Roach and several others.

On the program there will be included exhibitions of bulldogging or steer wrestling, bronc and steer riding, fancy and trick riding, wild horse race, calf roping and fancy and trick roping.

To anyone not familiar with the performances offered by the great rodeo stars, the thrill of a lifetime is promised and even those who have seen the metropolitan versions of the rodeo will find a new thrill in the Fort Worth show.

Rodeo judges will include Captain Tom Hickman, famous captain of the Texas Rangers and one of the most noted peace officers in the country; Sheriff J. R. "Red" Wright, of Tarrant County; Chief Henry Lee, of the Fort Worth Police Department; and Guy L. Waggoner, eldest son of America's wealthiest cattleman.

Music will be furnished by the Texas Christian University Band of 60 pieces, and between the rodeo numbers special entertainment features will be provided, including an exhibition by "Red" Sublett and his trick mule. Transportation from hotels to the exposition grounds will be furnished free to all visitors.

The entertainment committee wishes to make it clear that this rodeo will be no "jump-up" performance, but will be a show in which a number of the world's greatest riders, ropers and steer wrestlers will appear. All of the performers are regular participants at the annual Exposition Rodeo in Fort Worth and it is their amazing skill and daring which attract tens of thousands of visitors to Fort Worth's great show each year, and bring them back, year after year.

# AIR TRAVEL AND PUBLIC HEALTH

FREDERICK L. HOFFMAN, LL. D., F. A. P. H. A.

*Consulting Statistician, The Prudential Insurance Company of America,  
Newark, N. J.*

THE forthcoming meeting of the American Public Health Association at Fort Worth suggests to many of those participating the use of the airplane not only as a time saving convenience but as a means of study as to the relation of air travel to public health. In the light of thirty thousand miles of air travel I can personally bear witness to the beneficial results of air journeys not only in this country, but in Mexico, the West Indies, Canada, and Continental Europe.

The modern airplane, however, has introduced certain health hazards which cannot be treated lightly. Not only is it conceivable that infected persons are transported by means of airplanes, but transmissible diseases may otherwise be conveyed through infected insects, plants, etc. The sanitary supervision of air travel and the possibility of quarantine of air passengers and goods as yet has hardly received consideration, but the subject is one well worth studying.

In Europe air ambulances for the conveyance of sick persons have attracted considerable attention and were dealt with at the International Convention. The conveyance of doctors to isolated localities to give prompt treatment, as well as the transportation of medicine, particularly antitoxins, has been made a matter of record in a number of instances, but to me the main aspect of air travel is the beneficial results to passengers who derive great advantages from even a few hours of journeys in the upper air. Personally I have never met with any disadvantages, and the so-

called risk of air sickness is largely exaggerated.

The questionnaires sent out to nearly a thousand registered pilots asking information as to the benefits of flying on health are almost uniformly in the affirmative. In not a single instance have the reports been to the effect that flying has been detrimental, regardless of the extraordinary strain on the nervous system on the part of pilots. Thus out of 895 replies returned, 713 were emphatically in the affirmative, while the remainder were neutral or ill defined. Out of the 895 only 40 reported having had air sickness, and these were mostly in connection with stunting performances.

It has been suggested that some of the members expecting to participate in the Fort Worth meeting may make use of the airplane for both rapid transportation and observational purposes. Dallas and Fort Worth are important air centers which can be easily reached by a number of lines. From Birmingham, Ala., the Delta Air Service makes the trip to Fort Worth in 2 days of about 4 hours flying each day at a cost of \$46.00. This is a wonderful trip full of interesting views.\*

A short journey can be made from Tulsa, Okla., to Fort Worth, Tex., in about 4 hours at a cost of \$17.00. But the main attraction is the opportunity of air trips to Mexico. These can be easily made from Fort Worth and Dallas

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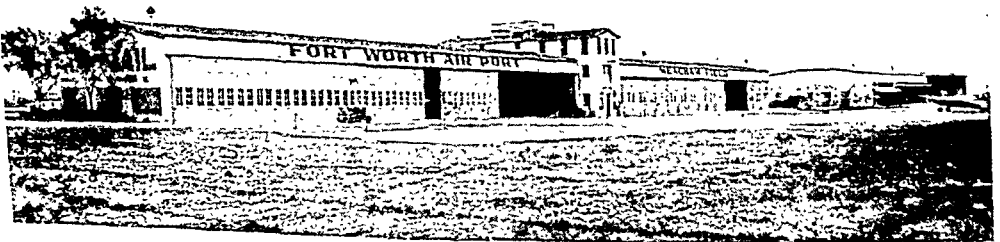
\* For a more detailed article, see Stone and Webster, *Journal*, April, 1930, pp. 462-481.

over the Southern Air Transport Line, leaving Fort Worth at 8.55 in the morning, arriving at Brownsville at 3.45 in the afternoon, leaving Brownsville next day at 8.15 in the morning and arriving at Mexico City at 1.45 p.m. The air rate from Fort Worth to Brownsville is \$28.44, while the rate from Brownsville to Mexico City is \$87.50. These rates, of course, are higher than rail rates but the time saving is considerable. Thus the train leaves Mexico City at 8.50 p.m. and reaches Laredo, Tex., 34 hours later, while the air time is only 5½ hours including stopping time at Tampico.

No greater opportunity is likely to present itself for many years to members of the American Public Health Association to become familiar with the new spirit of Mexico in health and medical matters. Progress in Mexico during the last five or six years in this respect has been prodigious. It was but recently my privilege to attend the Latin-American Congress in Mexico City in connection with which I made the entire trip from Birmingham, Ala., to Mexico City by air without the slightest inconvenience or delay. For sight-seeing purposes it is difficult to match this wonderful journey which includes considerable flying over the waters of the Gulf and the lagoons of

Southern Texas. The trip, of course, can easily be extended to other parts of Mexico, particularly Vera Cruz and Yucatan on the one hand, and Guatemala on the other. The rates, considering the enormous amount of saving in time, are not excessive or prohibitive.

Modern Mexico will astonish Americans who have never visited it. The developments in public health service during recent years have largely followed American lines of procedure. The new building of the Public Health Service of Mexico has nothing in America to outmatch it. The health officials are men of high standing in their profession, while everywhere one may meet physicians and surgeons of outstanding qualifications. There are some very admirable clinics in Mexico City worthy of a visit, while the historical attractions of the city and other parts of Mexico offer no end of opportunities, arousing the imagination and giving delight to the mind of searchers of the picturesque. I therefore hope that many of the visiting members of the American Public Health Association will be able to take advantage of the extension trip. I can conceive of no greater attraction to induce members to participate in the Fort Worth meeting than this additional pleasure of a possible visit to Mexico City.



*Fort Worth Municipal Airport*



# ASSOCIATION NEWS

## ORGANIZATION OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

THE Constitution of the Association as amended by the Association at its Fifty-Eighth Annual Meeting and the new By-laws adopted by the Governing Council at that meeting included a number of changes calculated to simplify the organization of the society and to provide a scheme to permit better coördination of its many activities. The principal changes were:

1. Creation of the office of President-elect and the inclusion of this officer on the Executive Board in place of the retiring President
2. The creation of the new office of Chairman of the Executive Board
3. The election of 2 members of the Executive Board each year for a 3-year term in place of electing 3 new members each year for a 2-year term
4. The creation of 4 standing committees appointed by and responsible to the Executive Board, with a view to placing all of the Association's activities under the direction of these committees. It was expected also that these committees would afford a channel for coördinating the work of section committees with each other and with the work of the Association. The composition and functions of these committees are described on pages 866 and 867 of the August issue of the JOURNAL.

The new By-laws did not take away the authority of the Executive Board to appoint special committees from time to time, and under this authority the Board has appointed the following special committees:

- Sedgwick Memorial Medal Committee
- Committee on Federal Health Legislation
- Committee to Extend the Association's Influence in South and Central Americas
- Committee to Coöperate with the Director of the Census
- Central Finance Committee
- Executive Committee of Executive Board

The sections and section committees retain their previous independence under the new plan. However, to provide an opportunity for correlating the work

of the sections with that of the Association, the section committees have been asked to report to one of the standing committees as well as to their respective sections.

Except for the fact that no appointment has been made to the office of secretary of the Committee on Research and Standards, the new organization has been completed as indicated by the diagram herewith presented.

The personnel of the Governing Council is shown on page XX of this issue of the JOURNAL. The personnel of the Executive Board and the standing committees follows:

### *Executive Board*

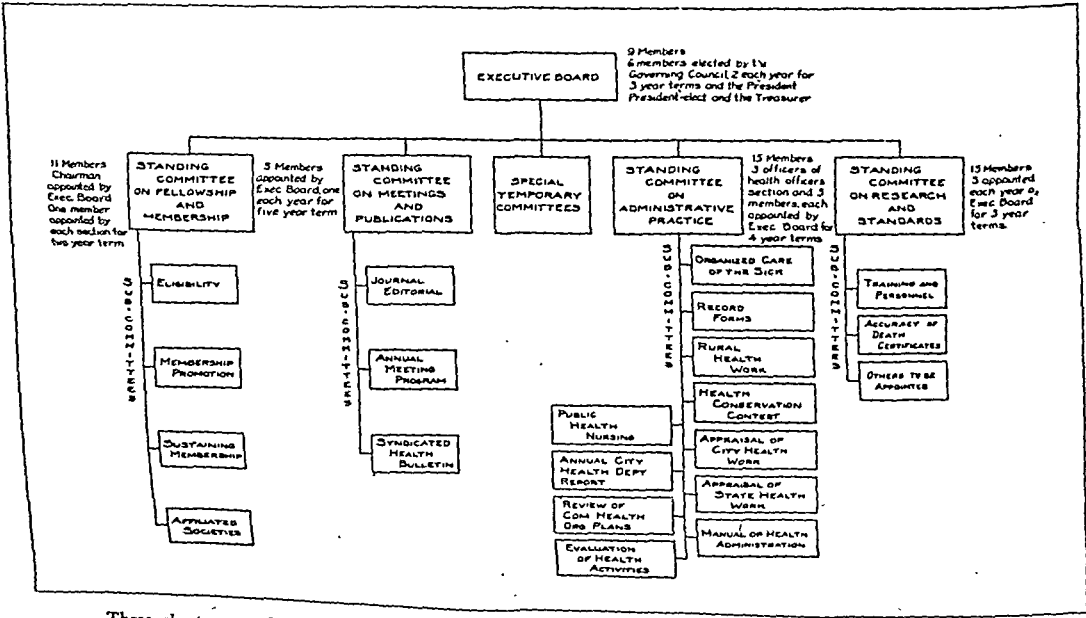
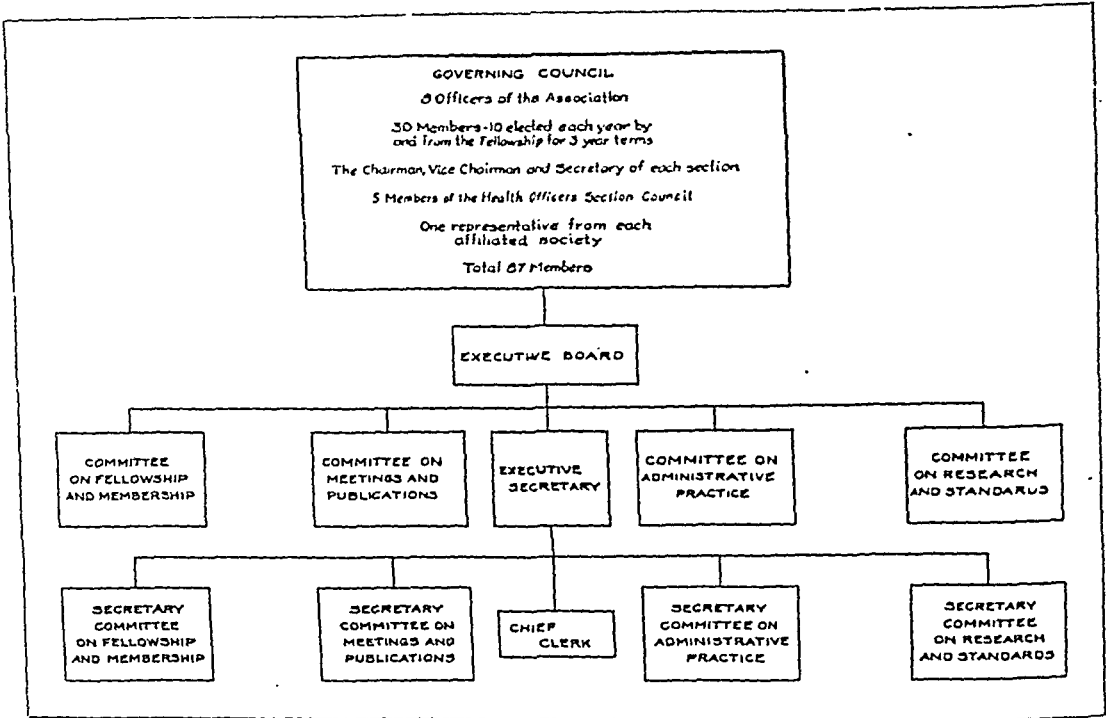
- W. S. Rankin, M.D. (1931), *Chairman*
- E. L. Bishop, M.D. (1932)
- A. J. Chesley, M.D. (1930)
- Hugh S. Cumming, M.D. (1930)
- Louis I. Dublin, Ph.D. (1930)
- Haven Emerson, M.D. (1930)
- William C. Hassler, M.D. (1930)
- Matthias Nicoll, Jr., M.D. (1932)
- Henry F. Vaughan, D.P.H. (1931)
- Homer N. Calver, *Executive Secretary*

### *Committee on Fellowship and Membership*

- Sally Lucas Jean (1931), *Chairman*
- B. L. Arms, M.D. (1930)—Laboratory Section
- F. C. Blanck, Ph.D. (1930)—Food, Drugs and Nutrition Section
- V. S. Cheney, M.D. (1931)—Industrial Hygiene Section
- Alta E. Dines, R.N. (1931)—Public Health Nursing Section
- Louis I. Dublin, Ph.D. (1931)—Vital Statistics Section
- John A. Ferrell, M.D. (1930)—Epidemiology Section
- E. L. Filby (1930)—Public Health Engineering Section
- H. E. Kleinschmidt, M.D. (1930)—Public Health Education Section
- J. H. Mason Knox, M.D. (1931)—Child Hygiene Section
- George C. Ruhland, M.D. (1931)—Health Officers' Section

Cornelia Lyne, *Secretary*

ORGANIZATION  
OF THE  
AMERICAN PUBLIC HEALTH ASSOCIATION



These charts were drawn for the JOURNAL in the office of C. C. Young.

*Committee on Meetings and Publications*

C. C. Young, D.P.H. (1933), *Chairman*  
 M. P. Ravenel, M.D. (1934)  
 C. F. Wilinsky, M.D. (1932)  
 W. P. Shepard, M.D. (1931)  
 John E. Monger, M.D. (1930)

Willimina M. Rayne, *Secretary*

*Committee on Administrative Practice*

C.-E. A. Winslow, Dr.P.H. (1933), *Chairman*  
 Haven Emerson, M.D. (1933)  
 Louis I. Dublin, Ph.D. (1933)  
 George C. Ruhland, M.D. (1932)  
 Henry F. Vaughan, D.P.H. (1932)  
 Allen W. Freeman, M.D. (1932)  
 Charles V. Chapin, M.D. (1931)  
 Sophie C. Nelson, R.N. (1931)  
 George T. Palmer, Dr.P.H. (1931)  
 Michael M. Davis, Ph.D. (1930)  
 W. S. Rankin, M.D. (1930)

George D. Lummis, M.D. (1930)

W. F. Draper, M.D. } *Officers of Health Of-*  
 E. L. Bishop, M.D. } *ficers' Section*  
 John L. Rice, M.D. }

W. F. Walker, Dr.P.H., *Secretary*

*Committee on Research and Standards*

Abel Wolman (1932), *Chairman*  
 Haven Emerson, M.D. (1932)  
 Edgar Sydenstricker (1932)  
 William H. Park, M.D. (1932)  
 Thomas Parran, Jr., M.D. (1932)  
 E. O. Jordan, Ph.D. (1931)  
 Wade H. Frost, M.D. (1931)  
 George W. Fuller (1931)  
 Henry C. Sherman (1931)  
 C. E. Turner (1931)  
 L. R. Thompson, M.D. (1930)  
 I. S. Falk, Ph.D. (1930)  
 Major A. Parker Hitchens (1930)

## ANNUAL MEETING INFORMATION

## REDUCED RAILROAD FARES

**R**EDUCED railroad fares on the Identification Certificate Plan have been authorized by the several Passenger Associations in the United States and Canada, which will entitle all members and dependent members of their families to a special rate of a fare and one-half for the round trip to Fort Worth.

Under this plan an Identification Certificate *must be presented* to the ticket agent when purchasing tickets. (One has been mailed to every member of the Association.) This is the ticket agent's authority to issue to delegates and dependent members of their families a round-trip ticket to Fort Worth at the reduced rate. The routing should be specified when making the purchase, for the routing covered by the round-trip ticket cannot be changed at Fort Worth.

All return tickets must be validated, before leaving Fort Worth, by the ticket agent who will be on hand at the Registration Desk in the Hotel Texas, or by the regular ticket office.

It is suggested that all members consult their local ticket agents in regard to dates of sale and return limit of reduced-

rate tickets, as these limits vary according to distance from Fort Worth.

The Passenger Associations have authorized a special rate of fare and three-fifths for delegates who are taking the post-convention tour to Mexico City. They should purchase tickets with return limit 30 days from date of sale.

Either fare and one-half or fare and three-fifths should be specified when purchasing tickets, depending upon whether or not the delegate returns immediately from Fort Worth or goes on to Mexico City.

## SPECIAL TRAINS TO FORT WORTH

**A**RRANGEMENTS have been made for delegates to Fort Worth to travel together in special trains or through cars from various points in the United States. St. Louis, Memphis, New Orleans, Portland, and Los Angeles have been selected as concentration points. A communication has been sent to the membership setting forth the advantages of such travel, and maps showing special train movements and schedules for special cars are repeated here for the sake of convenience. (See pages 1134, 1135 and 1136.)

## SCHEDULES FOR SPECIAL CARS TO THE ANNUAL MEETING

## LOUISVILLE, KY., NASHVILLE, TENN., DELEGATES

## CONCENTRATION POINT, MEMPHIS, TENN.

Lv. Louisville, Ky.	L. & N.	No. 99	Sat.	Oct. 25	12:47 P.M.
Ar. Memphis, Tenn.	L. & N.	No. 99	Sat.	Oct. 25	10:00 P.M.
Lv. Nashville, Tenn.	N. C. & St. L.	No. 6	Sat.	Oct. 25	2:45 P.M.
Ar. Memphis, Tenn.	N. C. & St. L.	No. 6	Sat.	Oct. 25	9:00 P.M.
Lv. Memphis, Tenn.	St. L. S. W.	No. 11	Sat.	Oct. 25	10:30 P.M.
Ar. Fort Worth, Tex.	St. L. S. W.	No. 11	Sun.	Oct. 26	1:55 P.M.

## JACKSONVILLE, ATLANTA, BIRMINGHAM, MONTGOMERY, NEW ORLEANS, HOUSTON DELEGATES

## CONCENTRATION POINT, NEW ORLEANS

Lv. Jacksonville, Fla.	S. A. L.-L. & N.	No. 3-2	Sat.	Oct. 25	9:45 A.M.
Ar. New Orleans, La.	S. A. L.-L. & N.	No. 3-2	Sun.	Oct. 26	6:50 A.M.
Lv. Atlanta, Ga.	A. W. P.-L. & N.	No. 37	Sat.	Oct. 25	6:05 P.M.
Ar. New Orleans, La.	A. W. P.-L. & N.	No. 37	Sun.	Oct. 26	8:30 A.M.
Lv. Birmingham, Ala.	L. & N.	No. 99	Sat.	Oct. 25	10:02 P.M.
Ar. New Orleans, La.	L. & N.	No. 99	Sun.	Oct. 26	9:05 A.M.
Lv. Montgomery, Ala.	L. & N.	No. 99	Sun.	Oct. 26	12:25 A.M.
Ar. New Orleans, La.	L. & N.	No. 99	Sun.	Oct. 26	9:05 A.M.
Lv. New Orleans, La.	Sou. Pac.	No. 101	Sun.	Oct. 26	10:40 A.M.
Ar. Houston, Tex.	Sou. Pac.	No. 101	Sun.	Oct. 26	8:45 P.M.
Lv. Houston, Tex.	M. K. & T.	No. 10	Sun.	Oct. 26	11:00 P.M.
Ar. Fort Worth, Tex.	M. K. & T.	No. 10	Mon.	Oct. 27	7:59 A.M.

## VANCOUVER, EVERETT, SEATTLE, TACOMA, SPOKANE, PORTLAND, AND PACIFIC NORTHWEST DELEGATES

## CONCENTRATION POINT, PORTLAND, ORE.

Lv. Vancouver, B. C.	Grt. Nor.	No. 357	Wed.	Oct. 22	11:59 P.M.
Ar. Seattle, Wash.	Grt. Nor.	No. 357	Thur.	Oct. 23	7:00 A.M.
Lv. Everett, Wash.	Grt. Nor.	No. 1	Thur.	Oct. 23	7:58 A.M.
Ar. Seattle, Wash.	Grt. Nor.	No. 1	Thur.	Oct. 23	9:00 A.M.
Lv. Seattle, Wash.	Grt. Nor.	No. 562	Thur.	Oct. 23	11:10 A.M.
Lv. Tacoma, Wash.	Grt. Nor.	No. 562	Thur.	Oct. 23	12:35 P.M.
Ar. Portland, Ore.	Grt. Nor.	No. 562	Thur.	Oct. 23	5:10 P.M.
Lv. Spokane, Wash.	S. P. & S.	No. 1	Wed.	Oct. 22	10:15 P.M.
Ar. Portland, Ore.	S. P. & S.	No. 1	Thur.	Oct. 23	9:00 A.M.
Lv. Portland, Ore.	Sou. Pac.	No. 15-60	Thur.	Oct. 23	6:15 P.M.
Lv. Salem, Ore.	Sou. Pac.	No. 15-60	Thur.	Oct. 23	8:20 P.M.
Lv. Eugene, Ore.	Sou. Pac.	No. 15-60	Thur.	Oct. 23	10:30 P.M.
Lv. Klamath Falls, Ore.	Sou. Pac.	No. 15-60	Fri.	Oct. 24	4:52 A.M.
Lv. Davis, Calif.	Sou. Pac.	No. 15-60	Fri.	Oct. 24	4:25 P.M.
Lv. Sacramento, Calif.	Sou. Pac.	No. 15-60	Fri.	Oct. 24	5:30 P.M.
Lv. Stockton, Calif.	Sou. Pac.	No. 15-60	Fri.	Oct. 24	7:03 P.M.
Ar. Fresno, Calif.	Sou. Pac.	No. 15-60	Fri.	Oct. 24	10:35 P.M.
Lv. Glendale, Calif.	Sou. Pac.	No. 15-60	Sat.	Oct. 25	8:02 A.M.
Ar. Los Angeles, Calif.	Sou. Pac.	No. 15-60	Sat.	Oct. 25	8:30 A.M.

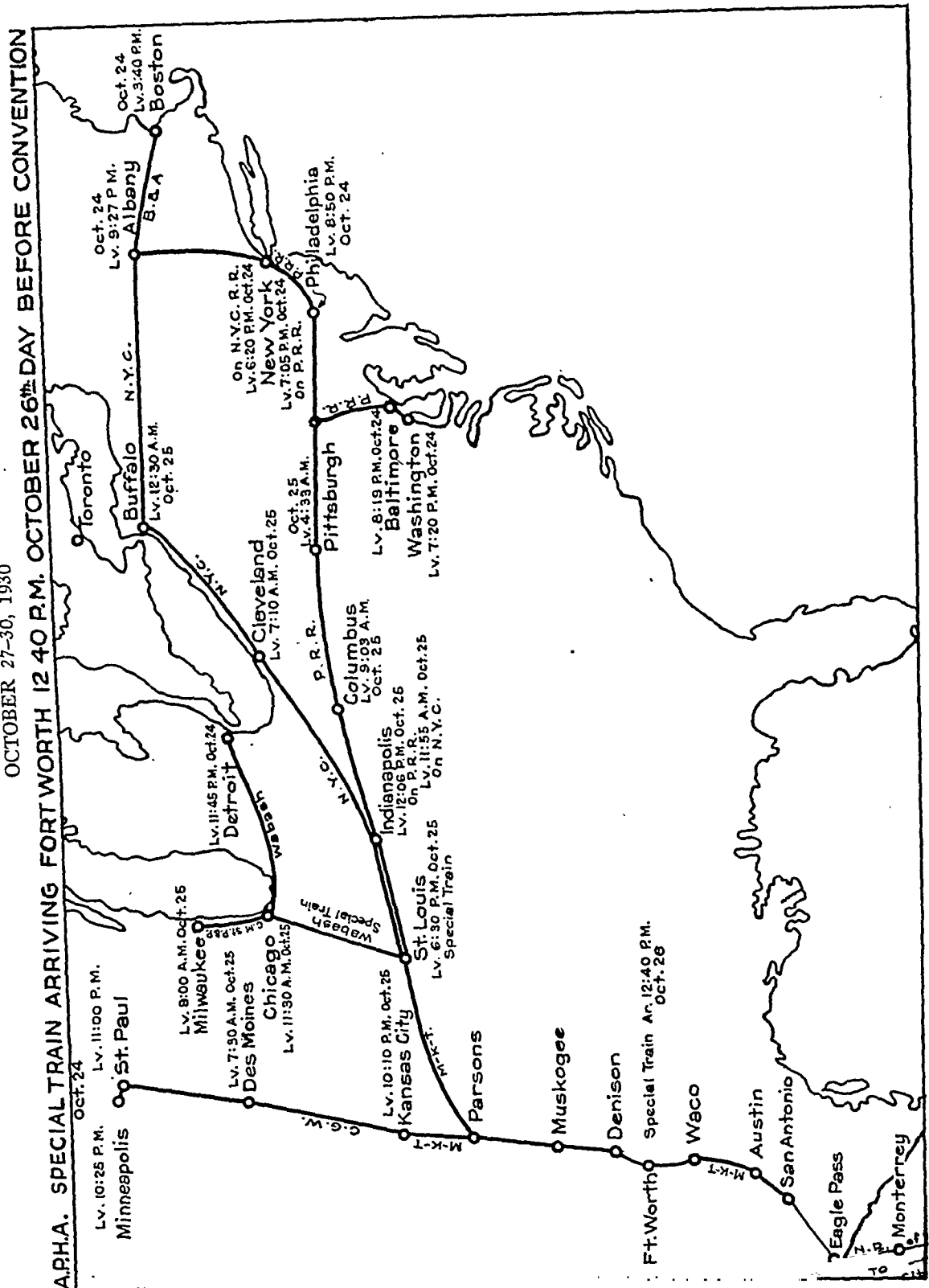
## OAKLAND, SAN FRANCISCO, SAN JOSE, DEL MONTE, SANTA BARBARA, SAN DIEGO DELEGATES

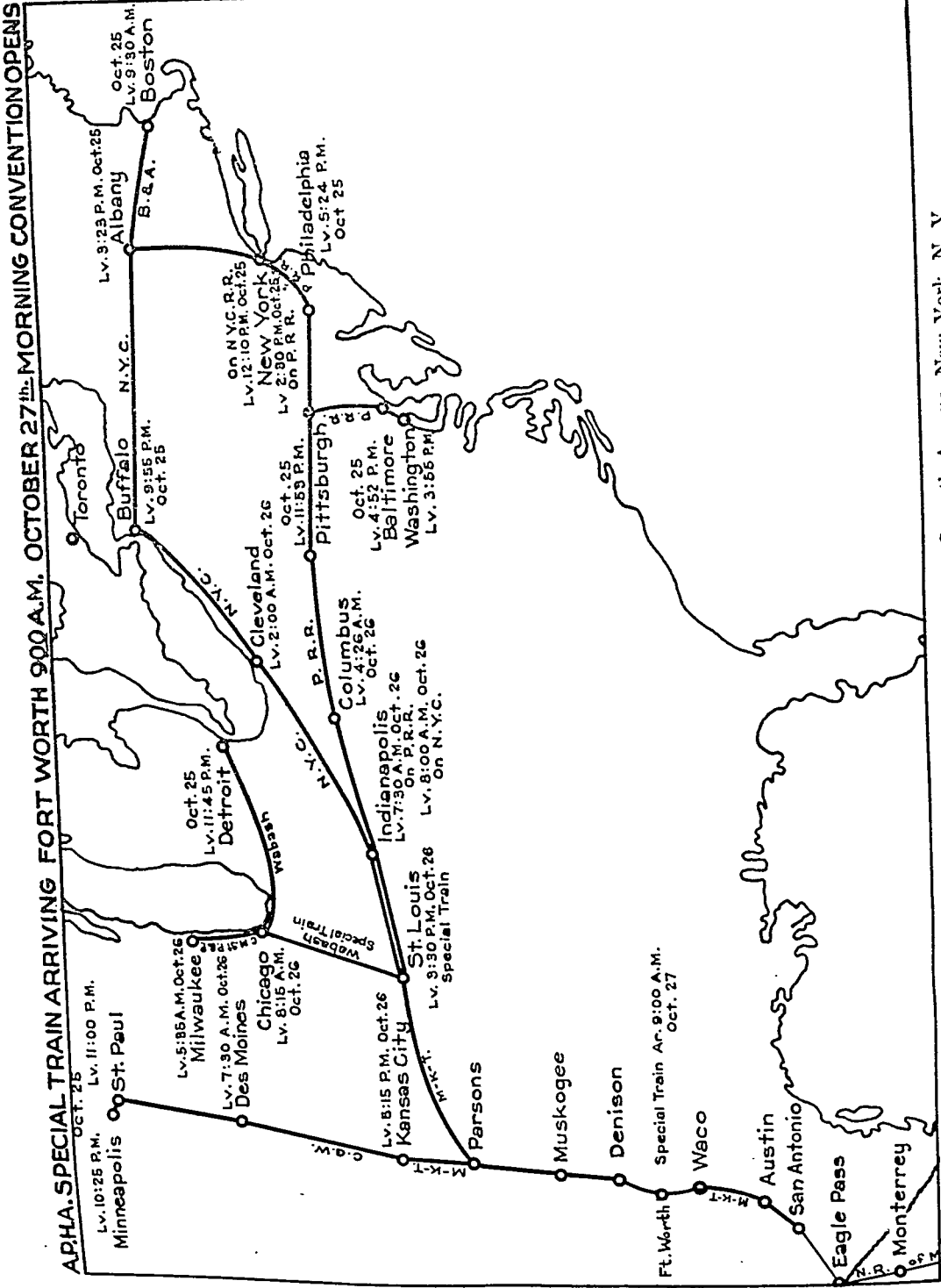
## CONCENTRATION POINT, LOS ANGELES

Lv. Oakland, Calif.	Sou. Pac.	No. 26	Fri.	Oct. 24	6:31 P.M.
Ar. Los Angeles, Calif.	Sou. Pac.	No. 26	Sat.	Oct. 25	8:40 A.M.
Lv. San Francisco, Calif.	Sou. Pac.	No. 102	Fri.	Oct. 24	6:15 P.M.
Lv. San Jose, Calif.	Sou. Pac.	No. 102	Fri.	Oct. 24	7:30 P.M.
Lv. Del Monte, Calif.	Sou. Pac.	No. 207	Fri.	Oct. 24	8:30 P.M.
Ar. Los Angeles, Calif.	Sou. Pac.	No. 102	Sat.	Oct. 25	8:15 A.M.
Lv. Santa Barbara, Calif.	Sou. Pac.	No. 76	Sat.	Oct. 25	6:10 A.M.
Ar. Los Angeles, Calif.	Sou. Pac.	No. 76	Sat.	Oct. 25	9:30 A.M.
Lv. San Diego, Calif.	A. T. & S. Fe	No. 79	Sat.	Oct. 25	2:10 A.M.
Ar. Los Angeles, Calif.	A. T. & S. Fe	No. 79	Sat.	Oct. 25	7:30 A.M.

(Sleeping Cars Ready for Occupancy at 9:45 P.M.)

## OCTOBER 27-30, 1930





AMERICAN PUBLIC HEALTH ASSOCIATION, 370 Seventh Avenue, New York, N. Y.

## AMENDMENT TO THE CONSTITUTION

IN accordance with the provision in the Constitution regarding amendments, the following amendment, which is to be offered at the forthcoming Annual Meeting, is hereby published as prescribed.

RESOLVED that Article III, Section A, of the Constitution, shall be amended by the addition of the following at the end of this section:

6. A representative to be designated by each regional branch. Such representative shall be a Fellow of the American Public Health Association.

This amendment, if approved by the Governing Council, will be presented to the Fellows present at the Fort Worth meeting. It requires a two-thirds vote of the Fellows present and voting, for ratification.

## NEW MEMBERS

*Health Officers Section*

- Otis L. Chason, M.D., Opelika, Ala., County Health Officer, Lee County  
 Gustav J. Hildebrand, M.D., Sheboygan, Wis., Health Officer  
 W. S. Hull, M.D., St. Joseph, Mo., County Health Officer  
 Thomas H. Johnston, M.D., Athens, Ga., Commissioner of Health  
 Dr. Walter Kleberg, Galveston, Tex., City Health Officer  
 W. F. Lunsford, M.D., Poteau, Okla., Director, LeFlore County Coöperative Health Unit  
 Alexander C. McKean, M.D., Provo, Utah, Director, Utah County Health Unit  
 W. M. Newman, M.D., Spokane, Wash., County Health Officer  
 Zenas V. D. Orton, M.D., Salem, N. Y., Health Officer  
 J. W. Pittman, M.D., Belton, Tex., County Health Officer  
 William Plattner, Brattleboro, Vt., Health Officer  
 Josiah B. Redfield, M.D., North Platte, Nebr., City Physician  
 Luther F. Rhodes, M.D., Fort Worth, Tex., County Physician  
 Dr. Hugo Robinson, Albany, Ga., Commissioner of Health  
 William V. Sanford, M.D., Murfreesboro, Tenn., Assistant Director, Rutherford County Health Department  
 George H. Spivey, M.D., Wink, Tex., Director, Winkler County Health Unit

*Laboratory Section*

- Helene T. Bennett, A.M., Yuma, Ariz., Director of Clinical Laboratory, Thomas Laboratories  
 E. H. Bramhall, B.S., Salt Lake City, Utah, Director, State Board of Health Laboratory

- Clarence R. DeYoung, B.S., Chicago, Ill., Senior Bacteriologist, Department of Health  
 Hugh N. Heffernan, B.S., New Orleans, La., Field Bacteriologist, State Board of Health  
 Archie H. Robertson, Ph.D., Albany, N. Y., Director, Food Laboratory, State Department of Agriculture and Markets  
 Richard F. Zedlitz, D.V.M., Ballinger, Tex., City Milk Inspector

*Public Health Engineering Section*

- Aaron D. Chandler, Fort Worth, Tex., Chief Plumbing Inspector, Engineering Department  
 O. K. Hobbs, Abilene, Tex., City Engineer  
 Leonard H. Male, Salt Lake City, Utah, State Sanitary Engineer  
 M. S. Kumaraswamy Pillay, Trivandrum, India, Section Officer, Water Works (Assoc.)  
 John R. Hoy, Jacksonville, Fla., Sanitary Engineer, Wallace & Tiernan Co.  
 G. T. Russell, Lufkin, Tex., Superintendent, City Water Works

*Food, Drugs and Nutrition Section*

- Leo F. Barthelme, B.V.S., Parsons, Kans., Milk and Dairy Inspector

*Child Hygiene Section*

- James J. Waring, M.D., Denver, Colo. (Assoc.)

*Public Health Education Section*

- John H. Bursleson, San Antonio, Tex., recently Chairman, Board of Health  
 William J. Johnson, M.D., San Antonio, Tex., Superintendent, State Hospital  
 Vera H. Jones, M.D., Denver, Colo., School Physician  
 Merl L. Pindell, M.D., Los Angeles, Calif., Consultant in Tuberculosis, Los Angeles County Health Department  
 Mrs. Joseph L. Smith, New York, N. Y., Division Chairman, Indian Welfare, General Federation of Women's Clubs

Sigrid Thorsen, San Jose, Calif., Public Health Nurse

Susan M. Wood, New York, N. Y., Executive Secretary, New York City Cancer Committee

*Public Health Nursing Section*

Olive A. Alling, Brooklyn, N. Y., on staff, Jewish Hospital School of Nursing

Martha H. Bredemeier, R.N., Sweetwater, Tex., Public Health Nurse, Nolan County Health Unit

Ada P. Coleman, Grand Rapids, Mich., Director, Visiting Nurse Association

K. M. Hudson, R.N., Salt Lake City, Utah, Executive Director, Visiting Nurse Association

Mrs. Emma S. Land, Henderson, Tenn., Division of Tuberculosis Control, Nursing, State Department of Health

Emma B. Litwiller, R.N., Ann Arbor, Mich., Student (Assoc.)

Ruth M. McCullagh, B.S., Quincy, Calif., Health Supervisor, Plumas County Schools

June P. Peck, Reedley, Calif. (Assoc.)

*Epidemiology Section*

Jesse C. Ellington, M.D., Kingsport, Tenn., Associate Epidemiologist, State Department of Health

*Unaffiliated*

Eusebio D. Aguilar, M.D., Manila, P. I., Senior Medical Inspector, Philippine Health Service

Henry M. Bracken, Claremont, Calif., Editor, Health Department, *Western Hospital Review*

Frank S. Bright, Washington, D. C. (Assoc.)

Robert A. Cooley, Bozeman, Mont., Rocky Mountain Spotted Fever

Charles C. Gidney, M.D., Plainview, Tex. (Assoc.)

Clarence C. Little, LL.D., Bar Harbor, Me., Managing Director, American Society for Control of Cancer

Charles Maertz, M.D., Cincinnati, O. (Assoc.)

J. Leonard McDonald, M.D., Cragmor, Colo. (Assoc.)

Garland H. Pace, Salt Lake City, Utah (Assoc.)

DECEASED MEMBERS

Kenneth Allen, New York, N. Y., Elected Member 1915, Fellow 1922

Charles O'H. Laughinghouse, M.D., Raleigh, N. C., Elected Member 1920

George Collins, Raleigh, N. C., Elected Member 1928

Charles P. Fox, M.Sc., Miamisburg, O., Elected Member 1919

George C. Gensheimer, Erie, Pa., Elected Member 1919

Carson V. Merritt, M.D., Flint, Mich., Elected Member 1923

Fowler A. Watters, M.D., Lockport, N. Y., Elected Member 1927

APPLICANTS FOR FELLOWSHIP

HEALTH OFFICERS: Benjamin Goldberg, M.D., Chicago, Ill.; Eugene H. Sullivan, Nutley, N. J.; F. Edward Whitehead, Morristown, N. J.

FOOD, DRUGS AND NUTRITION: Joseph Parke Bushong, M.D., Los Angeles, Calif.

CHILD HYGIENE: Pauline B. Williamson, New York, N. Y.

INDUSTRIAL HYGIENE: Daniel L. Lynch, M.D., Boston, Mass.

PUBLIC HEALTH ENGINEERING: Ralph E. Tarbett, Washington, D. C.

CORRECTIONS

Edward Desmond Hopkins, Fort Worth, Tex., listed in the September JOURNAL as Unaffiliated, has since applied for fellowship in the Public Health

Engineering Section of the Association. The name of Charles Frederick Adams was published in the September JOURNAL as Charles Henry Adams.

MEMBERSHIP LIST

*Publication of the List of Members of the A. P. H. A. has been delayed. Announcement of date of publication will be made in November JOURNAL.*



# PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

**Decrease of Hookworm**—Hookworm infection is still widespread geographically in the southern states. The Pythagoristic standardization of carriers versus patients predicated on hookworm oölogy and used as a basis in the very interesting studies conducted in Alabama should be restudied and checked, both from the standpoint of objective and subjective, measurable and unmeasurable factors, and until fully confirmed should not be taken as justifying health officers in assuming a position that light cases of hookworm infection are to be ignored clinically or to be discouraged from or prejudiced against treatment. County health officers should establish their hookworm eradication programs through the agency of the family physician who should give the treatments. Education should function through schools, churches, industries, and public health nurses.—C. W. Stiles, *Decrease of Hookworm Disease in the United States*, *Pub. Health Rep.*, 45, 1763 (Aug. 1), 1930.

**Influenza in Cleveland**—There were reported 5,922 cases of influenza in Cleveland during the 2 months, December and January, 1928-1929, and 315 deaths due to this cause. It is estimated that 17,300 cases of influenza occurred. As compared with the winter months of the 5 preceding years, the winter of 1928-1929 had an excess of 42 per cent in total deaths. Beyond the age of 5 years the fatality rate increased with age. The highest case rates occurred in the congested parts of the city. The peak of incidence in 16 of the 18 districts into which the city was divided occurred in the week of December 23.

In the other two districts the peak occurred in the preceding week. Secondary peaks occurred in five districts, all in the southeastern part of the city. All the secondary peaks occurred in the week of January 6.—H. W. Green and H. L. Rockwood, *The 1928-1929 Influenza Epidemic in Cleveland*, *J. Prev. Med.*, 4, 251 (July), 1930.

**Diphtheria Prevention in Philadelphia**—In June, 1930, the third annual campaign for immunization against diphtheria was conducted. It is estimated that 70 per cent of the public school population and 60 per cent of the parochial school children have been protected with a resulting decrease of 50 per cent in the incidence of this disease. There were established in June 98 points where toxin-antitoxin was administered free to 23,000 children. Publicity was given through circulars and campaign literature, news articles and advertisements in the daily papers, radio announcements, posters in street cars, buses and taxicabs and notices on billboards in various parts of the city.—H. L. Hartley, *Campaign for Immunization against Diphtheria*, *Bulletin Philadelphia Health Dept.*, Aug., 1930.

**Morbidity Area**—The following suggestions have been made as criterions in determining the admissibility to the proposed morbidity reporting area of states having 500,000 or more population:

1. The state shall be in the registration areas for births and deaths.
2. The state shall have a morbidity reporting law or regulations requiring—A. An immediate report to the local health officer of each case of diphtheria, infantile paralysis, measles,

smallpox, scarlet fever, typhoid fever, tuberculosis, whooping cough, giving name, age, sex, and address. B. (1) A daily report by the local health officer to the State Health Department of each case reported to him, giving the above details of name, age, sex and address. (2) A report at least once weekly of the total cases of each disease reported during the preceding week, and a monthly summary of each disease by age and sex.

3. A check made each month on the deaths

from the above mentioned diseases to ascertain whether or not they have previously been reported as cases.

4. The state shall attain a suitable fatality rate for diphtheria, measles, scarlet fever, typhoid fever, and whooping cough.—

R. C. Williams, The Proposed Morbidity Reporting Area, *Pub. Health Rep.*, 45, 1781 (Aug. 1), 1930.

## LABORATORY

C. C. YOUNG, D. P. H.

### A SIMPLE METHOD FOR INDICATING THE VARIOUS SUGARS USED IN THE CARBOHYDRATE SERIES

R. V. STONE, D. V. M.

*Director, Bureau of Laboratories, Los Angeles County Health Department,  
Los Angeles, Calif.*

IN the past, laboratories have resorted to various methods of marking test tubes containing various carbohydrates for identification of organisms through their fermentative reactions. Two methods commonly in practice consisted of actually labelling the test tubes with frosted numbers indicating the sugars, or of coloring the cotton stoppers with aniline dyes, using a different color for each carbohydrate. Both methods were objectionable since either the test tubes had to be carefully sorted for the sugar they were to contain, or the dye on the stoppers was frequently transferred to the worker's fingers. The method of marking each tube with a wax pencil is the most common. It has the objection of consuming considerable time, and involving considerable processing in cleaning the tubes.

The Bureau of Laboratories of the Los Angeles County Health Department has for some time had in use a simple scheme developed by the writer. Glass beads commercially designated as "No.

2, cut beads" can be obtained in a variety of colors. The most practical series of colors are: red, opal, amber, light blue, black and dark green. A color is assigned to each sugar and used throughout the laboratories. Red beads indicate dextrose; amber mannite; opal maltose; blue lactose; black saccharose; and dark green plain broth.

It is a simple matter, in use, to recognize the sugar by the color of the bead. The identification charts which give the reactions of various organisms with sugars are marked at the top in colors similar to those of the beads. The sugar series is taken from the rack after incubation and the beads quickly matched with the same colors on the chart. Recording of reactions is rapidly made.

When washing the tubes after the tests the broth is emptied through a sieve and the beads collected are rapidly sorted according to their colors and are ready for use in the next batch of medium.

# A STORAGE BIN FOR LABORATORY GLASSWARE

C. S. MUDGE, F. A. P. H. A.

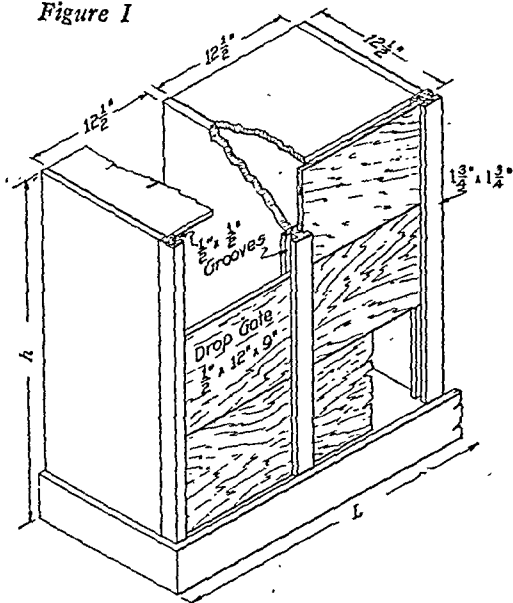
*Associate Bacteriologist, Division of Dairy Industry, University of California  
College of Agriculture, Davis, Calif.*

**D**UE to the reorganization of the service room in the bacteriological laboratory of this institution, overcrowding was imminent, which was solved by the installation of storage bins described below.

The measurements were based on the size of petri dishes, but other glassware has been found to fit nicely into the space. A series of upright partitions was erected, upon the outside edge of which were fastened strips of lumber— $1\frac{3}{4}'' \times 1\frac{3}{4}''$ —ruled out as shown in Figure I. Gates or slides were made to fit into these grooves.

Petri dishes were placed on the floor of the bin—three each way—and other dishes were piled upon these, a slide being inserted as the pile grew. Thus, it was possible to receive and dispense petri dishes, always having them easily accessible. Although in one of the bins the dishes are 80 high, no breakage has been noticed due to the weight of the superimposed glassware.

Figure I



For dilution bottles we have found these bins convenient. In this case each layer has been separated from the one above by egg case flats.

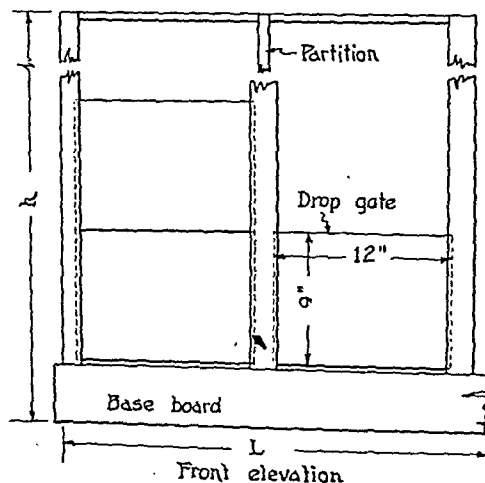
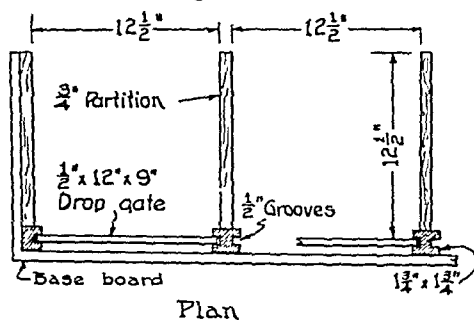
One and two liter flasks have been stowed successfully by inverting some of the flasks between the upright ones.

Although the height of these bins may be varied, those in this laboratory are 7' high, which has proved entirely satisfactory.

In teaching laboratories, where at times large numbers of dishes and flasks are issued for exercises, it has been found that the flexibility of this method of storage is a great help.

Figure II is given to show the plan of the bin.

Figure II



# VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

**Appendicitis Mortality**—In the 19 years since 1911 a steady upward trend in appendicitis mortality rates has been observed among Metropolitan policy holders. The year 1929 had one of the highest appendicitis death rates on record. Comparing the first 5 with the last 5 years of this 19-year period, we find an increase of 20 per cent in the death rate for white males and of 14 per cent for white females.

The increases in fatalities have varied by age. For children under 5 years, the appendicitis death rate in 1925-1929 was 11.5 per 100,000 for white males, an increase of 126 per cent since 1911-1915. For white females, the recent death rate at this age period was 9.2 per 100,000, an increase of 92 per cent since 1911-1915. Only between 10 and 19 years of age was there any decrease in appendicitis mortality for both males and females. Here the decrease was about 3 per cent for white males and between 10 and 15 per cent for white females. Beginning with adult life, however, the appendicitis death rate showed marked increases in the period 1925-1929, as compared with 1911-1915. During adult life it was generally true that the higher the age the greater the rise in mortality.

In general, appendicitis mortality among males is higher than that of females. In 1911-1915, the death rate of males exceeded that of females by 26 per cent. In 1925-1929, in view of the greater increases in mortality among males than among females, the excess in the death rate of males had risen to 33 per cent. As measured by these data, the disease seems not to be equally common in males and females, as has been

suggested in standard texts on the subject.

Much of the recorded increase in appendicitis mortality in recent years seems to be real and is not due in large part to greater precision in reporting. Beginning with 1911 great care has been exercised in securing more complete statements of the causes of death from physicians and surgeons. It is believed that the statistics included in this survey are as nearly complete as such data ever will be. Hence, the recorded increase in appendicitis mortality among these policy holders must reflect, by and large, a real change in the factors leading to fatal appendicitis. At the present time we do not know what those factors are.

In former years, it was assumed that high appendicitis rates prevailed in years characterized by high prevalence of general intestinal infections. The sharp fall of death rates for diarrhea and enteritis since 1911, resulting from the protection of milk, and other food supplies, suggests, however, that food infections of the kind prevailing years ago were not a primary factor in bringing on the recent increase in appendicitis mortality.

The subject is of sufficient importance to warrant well founded and critical inquiry into the prevailing and indisputably increasing incidence of fatal appendicitis. More than 18,000 deaths from the disease occurred in the United States during 1928.—*Stat. Bull., Met. Life Ins. Co.*, 1: 1-3 (July), 1930.

## Mortality Statistics. 1929—

**Maine**—The Department of Commerce announces that there were 11,353 deaths in Maine during 1929 as com-

pared with 11,005 in 1928. The number of deaths (523) from influenza in 1929 was almost double the number (278) which occurred in 1928, and this increase was mainly responsible for the increase in the total number of deaths which occurred during the year 1929, as compared with 1928. The number of deaths (2,189) due to diseases of the heart represents the largest number for the 4-year period. Cancer, with 1,120 deaths, also showed a continuous increase. The increase in the number of deaths from diarrhea and enteritis in children under 2 years of age was especially noticeable in the 2 years, 1928 and 1929.

Most significant among the decreases in deaths were those due to nephritis (877 to 825), and cerebral hemorrhage and softening (1,134 to 1,090). Decreases were also reported for a number of the epidemic and infectious diseases, including diphtheria, scarlet fever, typhoid fever, whooping cough and others. None of these, however, was responsible for an appreciable number of deaths in the state.

The number of deaths from accidental and unspecified external causes decreased from 638 in 1928 to 585 in 1929. Especially noteworthy was the decrease in the number of drownings from 114 to 81. This decrease, however, was more than offset by the large increase from 115 to 151 in the number of deaths due to automobile accidents and an increase of 20 in the number of suicides.

*Montana*—There were 5,742 deaths in Montana during 1929 as compared with 5,780 in 1928.

The numbers of deaths from influenza in 1928 and 1929 greatly exceeded the number from this disease in 1927 and were in a considerable measure responsible for the increase in the total number of deaths in this state for the latter years. There was an increase each succeeding year reported from cancer and

other malignant tumors, diseases of the heart, appendicitis and typhlitis, and a few other less important causes of death.

Other increases were from measles, 8 to 50, typhoid and paratyphoid fever, from 16 to 31, and puerperal septicemia, from 28 to 42. The number of deaths from tuberculosis was less than for any previous year shown in the table, and noteworthy decreases were reported in the number of deaths from cerebral hemorrhage and softening and diabetes mellitus.

The number of deaths due to accidental and unspecified external causes was practically the same as in prior years, but for the years 1928 and 1929 there was a considerable increase in the number of deaths due to automobile accidents, as compared with the years 1926 and 1927.

*Nevada*—Nevada reports 1,199 deaths in 1929—the first year of its admission to the registration area.

The principal causes of death in order of their importance were diseases of the heart, 165; pneumonia, all forms, 98; tuberculosis, all forms, 87; cancer, 80; and nephritis, 72.

Of the deaths due to accidental and unspecified external causes, the greatest number was caused by automobile accidents, with 45, mine accidents second, with 15, and railroad accidents and accidental falls having the same number of 14 each.

*North Dakota*—There were 5,421 deaths in North Dakota during 1929 as compared with 5,513 in 1928.

The same 5 causes of death ranked the highest during the 4 years 1926 to 1929; in 1929 they were in the following order: diseases of the heart (796), congenital malformations and diseases of early infancy (486), cancer (457), pneumonia, all forms (424), and cerebral hemorrhage and softening (420). Other causes which were among the next highest during this period were nephritis, influenza, and tuberculosis, all

forms. The deaths from diseases of the heart, pneumonia, all forms, and influenza in 1928 and 1929, greatly exceeded those in 1927, while the deaths from tuberculosis were noticeably fewer.

In 1929 marked increases from 1928 were reported in deaths from measles, meningococcus meningitis, diphtheria, whooping cough, and diarrhea and enteritis, under 2 years; decreases in deaths were shown for diabetes mellitus, scarlet fever, and acute anterior poliomyelitis.

The greatest number of deaths in 1929 from accidental and unspecified external causes was due to automobile accidents (88 as compared with 79 in 1928), followed by accidental falls and accidental drowning.

*Wisconsin*—The Department of Commerce announces that there were 31,287 deaths in Wisconsin during 1929 as compared with 31,788 in 1928.

Deaths from measles increased from 12 in 1928 to 86 in 1929, and from whooping cough from 79 to 121, but even these large numbers in 1929 compare favorably with the very much larger ones in 1926 (154 and 175, respectively).

The deaths from diseases of the heart and cerebral hemorrhage and softening increased steadily and considerably in each year from 1926 to 1929, but, on the other hand, deaths from diphtheria, tuberculosis, all forms, diarrhea and enteritis, under 2 years, and congenital malformations and diseases of early infancy decreased, similarly, throughout this period.

In addition to those mentioned, other important decreases in deaths from 1928 to 1929 were from influenza, diabetes mellitus, pneumonia, all forms, and nephritis.

Deaths from suicide increased from 404 in 1928 to 453 in 1929.

The deaths from accidental and unspecified external causes increased continuously from 1,790 in 1926 to 2,268 in

1929, and the increase of 118 from 1928 to 1929 was nearly accounted for by the increase in deaths from accidental falls (420 to 518). While the deaths from automobile accidents, excluding collisions with railroad trains and street cars, decreased by 8 from 1928 to 1929, the number of deaths from this cause increased from 384 in 1926 to 612 in 1929, or approximately 60 per cent in the 4-year period.

*Delaware*—There were 3,132 deaths in Delaware during 1929 as compared with 3,196 in 1928.

The decreases in deaths from diseases of the heart, nephritis, typhoid and paratyphoid fever, and syphilis in 1929 as compared with 1928 were almost balanced by increases from pneumonia, all forms, influenza, whooping cough, and diabetes mellitus.

There was a steady decline in the number of deaths from syphilis, tuberculosis, all forms, and nephritis from 1926 to 1929.

There was a considerable decrease in the number of deaths from accidental and unspecified external causes in 1929 as compared with 1928, the decrease being more than accounted for by decreases in accidental drowning, accidental falls, and automobile accidents, the last of these causes dropping from 75 to 57.—*Mortality Statistics: Provisional Summaries*, U. S. Census Bureau.

**Public Health Conditions and Administration in Burma**—Burma is divided into 7 civil divisions for purposes of administration. The civil surgeon of each district is also the medical officer of health and is required to advise all local authorities in his district on matters of public hygiene. The local authorities employ public health workers. In 1927, they engaged 84 public health inspectors, 27 of them in rural areas. Birth and death registers are in charge of village headmen and are inspected by district health officers. Registration is

inaccurate and incomplete because of illiteracy and the fact that registrars have to bear the expense of submitting returns. The provincial birth rate was recorded as 25.08 per 1,000 in 1927; the rural birth rate was 24.70 and the urban 27.98. The provincial death rate was 19.55 per 1,000, the proportion of males per 100 females being 114; the rural rate was 17.38, the urban 36.21. Infant mortality was recorded as 198 per 1,000, 118 male infants dying to every 100 females, 51 per cent of these deaths being between the ages of 2 and 6 months.

There were 4,528 deaths from cholera, 1,704 from smallpox and 3,508 from plague. Urban areas were affected more by these diseases than rural, especially in the case of plague. Cholera is combated by inoculations and vigorous campaigns are carried out whenever cholera breaks out in epidemic form. Vaccination for smallpox is carried out by public vaccinators employed by local authorities. From cases treated in hospitals, statistics show case mortality to be 7 per cent among vaccinated and as high as 32 per cent among unvaccinated persons. Plague is combated by rat destruction and inoculation. There were 102,859 persons inoculated in 1927, of which 60,235 were done in towns. Venereal disease is known to be very prevalent but there are no reliable statistics available. Syphilis was found to be present in 10 per cent of 897 post-mortems in one of the large hospitals.

Local authorities are responsible for expenditures of water supply, drainage, road cleaning and watering, sewage disposal, public markets and abattoirs. They receive an annual government contribution to maintain these public health works. Municipal committees seldom receive any grant. Government inspection of schools and school children is compulsory in government high and middle schools.—Major H. C. C.

Cherry, *J. Roy. San. Inst.*, 51: 20-28 (July), 1930.

**Mortality Experience of the First Six Months of 1930**—A new record for low mortality has been registered for the winter and spring seasons of 1930. This applies to Canada as well as to the United States. In the latter, the white population has enjoyed better health than during the corresponding period of any previous year; and the death rate of the colored people has never been so low—with a single exception. The improvement has probably extended to all ages of the population—although this cannot be stated unreservedly at this writing. It is certain, nevertheless, that the chief scourges of childhood are taking a smaller death toll than ever before; that tuberculosis, which causes death chiefly in early adult and middle life, is recording a death rate far below the previous minimum; and that the mortality rates from several diseases, which are important factors in later life, have shown noteworthy declines in 1930.

These statements are based on the mortality experience of approximately 19,000,000 persons—the industrial policy holders of the Metropolitan Life Insurance Company in the United States and Canada. The health records of this large cross-section of the population have invariably proved, in the past, to be accurate indices of the health conditions prevailing in the general populations of both countries.

As in 1929, a large reduction in the tuberculosis death rate to a new minimum bids fair to be the outstanding public health fact of the year. The figure for the first half of 1930 was 85.6 deaths per 100,000 policy holders. Both white and colored policy holders have shared in the decline, with the former showing the greater drop in death rate.

The improvement in the diphtheria mortality rate is an outstanding item in

the health record of 1930, to date, and is second in importance to the splendid record for tuberculosis. The diphtheria death rate has dropped approximately 27 per cent in a single year. Unless unexpected epidemic prevalence of this disease is encountered at some time during the latter half of the year, 1930 will not only register a new minimum death rate for diphtheria, but will mark the largest year-to-year drop ever recorded. Still another favorable item in the 1930 health report is the record for diseases related to childbearing, which have every prospect of recording a new minimum death rate this year.

The absence of any widespread prevalence of influenza has resulted in about the normal winter and spring death rate for that disease. The drop in influenza mortality has been reflected in a considerable decline for pneumonia. The decreases recorded this year for heart disease and chronic nephritis are also

due, in part, to the lower prevalence of influenza which, when epidemic, always hastens the deaths of many persons who suffer from chronic diseases. A slight decline in the cancer death rate has persisted throughout the half-year. The diabetes death rate (19.6 per 100,000) may be compared with 21.0 for the like period of 1929.

Suicides have been a little more frequent than in the corresponding part of 1929, while the homicide death rate and that for fatal accidents have dropped slightly. The mortality from automobile accidents is higher than ever before at this time of the year. Thirty-eight hundred and ninety-nine Metropolitan Industrial policy holders were killed in 1929 in motor vehicle accidents; and the estimated loss of life in the United States from this cause was 31,400. These totals will probably be exceeded this year.—*Stat. Bull., Met. Life Ins. Co.*, 11: 3-6 (July), 1930.



# PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

## PROGRESS REPORT OF PULASKI, VA., RESERVOIR STUDIES \*

F. J. SETTE

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THERE is usually objection on the part of laymen to stored water supplies. There are various reasons for this objection. In the first place, stored water is classed in their minds as stagnant. Again, odors and tastes are at times objectionable in impounded water, enhancing the popular dislike. Other troubles, too, add to the general distrust.

Many supplies in Virginia depend mainly on springs of unknown origin and uncertain flow. When it becomes essential to provide a more certain supply, it will be necessary to impound surface waters. Therefore, at the suggestion of Richard Messer, Chief Engineer of the Virginia State Department of Health, a study of an existing reservoir—that at Pulaski—was begun. This investigation is to answer, if possible, questions as to odors and taste, corrosion, tuberculation, and the like. The study was to include not only the physical, chemical and biological conditions, but also run-off. Unfortunately, since the supply is not entirely metered, this phase of study has not yet been started. The microscopic life has not as yet been so prominent; few organisms having developed in quantities large enough to be interesting. The report, therefore, resolves itself into a study of the physical and chemical conditions.

The present supply is obtained from a watershed lying in the foothills of Draper Mountain approximately 3 miles southwest of Pulaski. This shed has an area of 1,746 acres, or 2.73 square miles, is entirely owned by the city, and is adequately protected. The reservoir impounds about 1/5 billion gal. of water. At the point of sampling, the depth is about 50 ft. when the surface of the water is level with the spillway. The sampling point is directly opposite the intake. The reservoir is Y shaped with the intake at the end of the Y stem. At this point, it is about 215 ft. wide and 50 ft. deep when full.

The study began on March 17 of this year. Apparently the spring overturn had occurred several weeks before, and was nearly at an end. It will be noticed that for 3 weeks the water was in a state of unstable equilibrium, finally having its last overturn on March 31. After

TABLE I

Temp. ° F.

Depth	March 17	March 24	March 31	April 7
Top	47.5	43.4	44.5	47.5
10'	47.2	45.2	44.5	47.5
20'	47.1	44.6	44.5	47.5
30'	43.6	44.5	44.3	45.7
40'	43.6	44.1	44.3	45.5
Bottom	43.8	44.1	44.1	45.5

\* Presented at the Second Annual Conference of the Virginia Water and Sewage Works Association at Norfolk, Va., June 19-20, 1930.

this date, the summer stagnation began in earnest. As the weeks progressed the stratification became more pronounced.

FIGURE I

Pulaski Reservoir Studies.

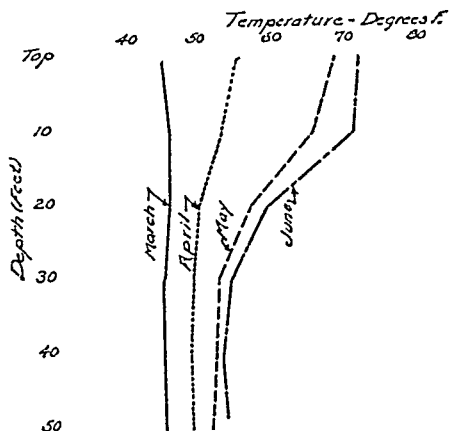
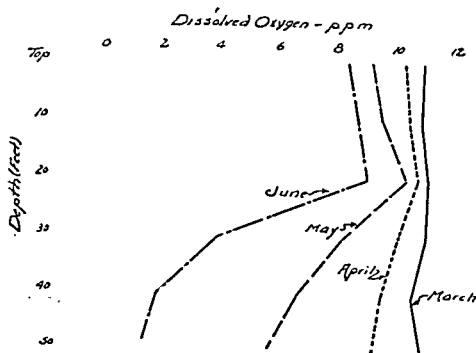


Table I gives the temperatures for the weeks around circulation. It can be seen that the reservoir was directly stratified on March 17, but this condition was only temporary. A cold snap, that week, overturned the water, which accounts for warmer bottom tempera-

FIGURE II

Pulaski Reservoir Studies.



tures on March 24. On March 31, the entire body of water was in circulation, although there is a difference of  $0.4^{\circ}$  F. between the top and bottom. It can be said, then, that for the period under discussion the reservoir was in circulation.

It is probable that the lake was in circulation for a month before observation began.

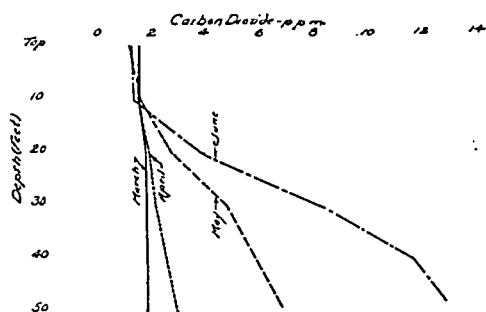
The averages for March, April, May, and June are plotted (see Figure I) to show the trend in stratification. It will be noticed that the zone of circulation is very clearly limited to the upper 10 ft. of the lake. This is even more apparent in Figure IV. On the other hand the zone of stagnation seems to begin at the 30-ft. depth. On June 30 the dissolved oxygen content was 1.06 p.p.m. at this level, whereas the average for the month was about 3.80. This shows that the oxygen is being used up very rapidly at this point.

Figures II and III show the trend of the dissolved oxygen and carbon dioxide content of the various layers for the different months.

What effect has stratification on the

FIGURE III

Pulaski Reservoir Studies.

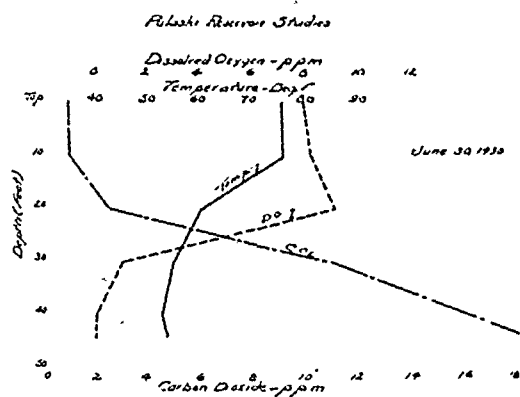


quality of the water? The question can be answered by the results obtained. It will be seen on Figures II and III that during the period of overturn, the water was fairly well aerated and decarbonated, but as stratification begins, a similar condition starts in the dissolved gases. The dissolved oxygen in the zone of circulation shows how well aerated that zone is. But, as the depth increases, the oxygen becomes depleted; being used up in the oxidation of the organic matter which settles to the bot-

tom. On the other hand, the carbon dioxide increases with the depth, a natural consequence of decomposition.

Curves showing the relationship between temperature, dissolved oxygen and carbon dioxide at various depths for June 30 are plotted on Figure IV. It will be noticed that at 20 ft. there is plenty of oxygen and little carbon dioxide.

FIGURE IV



Various organisms have been found, but the most prolific thus far are pandorina, dinobryon and glenodinium. These organisms will give trouble when they become more numerous. Some

other organisms have been found which are interesting, but thus far they have not been identified. Since these organisms are among the higher forms of life, their identification has been allowed to wait.

Water at the Pulaski reservoir is drawn from about the 20-ft. level. Thus far this level has been well within the zone of circulation and transition. However, as the season advances, it may be that it will fall in the stagnant zone. Then trouble may be expected not only from organisms, but also from stagnant water. Later on, tap samples will be taken to determine which of these two is responsible for whatever troubles may develop.

It will also be noticed that the  $\text{CO}_2$  content of the water at the 20-ft. level is now 2.6 p.p.m. and is increasing rapidly. Since the water is very soft, most of the  $\text{CO}_2$  is aggressive and the water may become highly corrosive, causing red water. This condition will occur undoubtedly in the late summer. However, the remedy can be determined only after a complete study, the results of which I hope to present next year.

# INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., PH. D., AND LEONARD GREENBURG,  
M. D., PH. D.

**The Mortality of Shopkeepers and Their Assistants**—Tables accompanying this article show that youths predominate as shop assistants, e.g., a comparative statement of age group proportions showing that per 1,000 total females there are employed in this group at the age of 16 years, 3,048; at 20 years, 2,285; at 25 years, 1,063; at 35 years, 542; at 45 years, 339; at 55 years, 187; at 65 years, 102; and at 70 years, 41. For the same ages the total employed per 1,000 occupied and retired persons are, respectively: 1,392; 1,234; 1,061; 788; 532; 310; 200; 142. Males are relatively more numerous than total occupied males at all ages under 35 and progressively less so afterwards. This is true also for females, in whose case the reduction in old age is even more extreme.

Evidence as to the health of shop assistants is confined to that of males during 1921-1923. Those employed in (1) businesses for the sale of fish, meat, greengrocery and milk; (2) businesses for the sale of grocery and provisions, and (3) businesses for the sale of textiles and clothing, are considered (tables accompany). It is noted that the mortality of those in fish, meat, etc., shops and in drapery shops, which form almost 40 per cent of the whole number of shop assistants, is considerably above that of their employers. In fact, mortality seems to be high for youths employed as shopkeepers and it seems that the highest mortalities are among those employed in open air conditions (fish, meat, greengrocery and milk trades).

The diabetes mortality is excessive for both employers and employees and especially for those engaged in the food dis-

tribution trades. Drapers, who are not especially subjected to overeating, form the only category not returning excessive mortality from diabetes.

Phthisis for shop keepers is below the average but for shop assistants is above the average. Here again it is found that, so far as the fresh air associated with open air trades proving a protection against respiratory diseases, mortality from respiratory diseases was over the average for this group, and under the average elsewhere.

If cirrhosis of the liver be accepted as an index of alcoholism, as it appears to be much the best provided by the returns, shopkeepers as a class and their assistants alike are notably alcoholic. In every case this rate exceeds the general average, to an extent ranging from 22 per cent for drapers' assistants, to 142 per cent for butchers, fishmongers, etc.

Comparative mortality figures showed cancer to be excessive among fish and meat dealers; cerebral hemorrhage was likewise excessive in this group as well as diseases of the circulatory system, heart disease and Bright's disease.

Shopkeepers ran below shop assistants in tuberculosis, respiratory tuberculosis, and bronchitis, but equal to or above in all other afflictions, including suicide and accidents.—T. H. C. Stevenson (General Register's Office, Great Britain), *Med. Off.*, 1147: 26-28 (July 19), 1930.

## The Silicosis Bill—

The government bill entitled the Workmen's Compensation (Silicosis) Bill has been read a second time in the House of Commons. It empowers the home secretary to make schemes to enable employers to pay compensation to work people who contract silicosis and provides for improved medical arrangements for the diagnosis and certification of the disease.

It has been found that the diagnosis requires great skill and the latest scientific appliances. The bill is intended to secure uniform and effective medical arrangements, by means of medical boards and panels in different centers, the work of which would be coördinated. It is also intended to provide for the payment of compensation for partial incapacity as a consequence of the disease in all the industries concerned. It is not suggested that all workers, who number between 60,000 and 70,000, need to be medically examined, but periodic examinations will be necessary for the early discovery and arrest of the disease before it has made progress. The bill extends compensation to workers in asbestos dust, who number about 2,200, of whom 1 in 8 have been found affected with silicosis.—

London Letter, *J. A. M. A.*, 94, 4: 277 (July 26), 1930.

**Night Work and Women's Health in Japan**—The Factories Division of the Urban-Prefectural Office of Osaka has made public the results of an investigation of Dr. H. Sukekawa into the effect of the abolition of night work upon the health of women workers. The study covered 1,000 women workers, from 14 to 30 years of age, living in dormitories attached to cotton-spinning factories, and covered the 5 years ending in 1930, during which night work was abolished.

Little variation was noted in the sickness rate, chiefly because workers obtained medical advice more frequently after the establishment of the health insurance system than before. Cases of tuberculosis, however, were not so numerous, and the average duration of sickness decreased. The attendance rate was 92 per cent before abolition of night work and 96 per cent after abolition. An improvement of the workers' appetites was proved by the increase of the per capita consumption of rice (10 per cent). Fatigue symptoms were found to be less in evidence.

When night work was practised, the maximum loss of weight during a week of night shifts was 3.9 kg. After the

abolition of night work, the maximum loss of weight during a week of afternoon shifts (2 p.m. to 11 p.m.) was 1.3 kg. At the same time, the number of persons who gained in weight, as well as the actual amount gained, during a week of morning shifts (5 a.m. to 2 p.m.) increased considerably.—*Indust. & Labour Inf.*, 34, 8: 280-281 (May 26), 1930, taken from *Osaka Mainichi*, 27 March, 1930.

**The Best Light for Clerical Work**—The National Physical Laboratory has investigated the subject of light for clerical work and made trials in some clerical offices badly supplied with natural daylight. Lights providing artificial daylight were compared with tungsten lamps.

The results obtained under laboratory conditions showed that, for equal illumination, artificial daylight was definitely preferred by clerks to light of the color of that given by a tungsten filament vacuum lamp. Light distributed over a room from an artificial window was preferred to light from a semi-indirect bowl fitting suspended from the ceiling. The average hourly rate of output of clerks showed a decided preference for light of artificial daylight color as compared with that of a tungsten vacuum lamp. Full scale experiments were then made in government offices by installing artificial daylight. Definite advantages were found when the artificial light had to be mixed with natural light, as in basement rooms. But in ordinary offices with effective window lighting, where artificial light had to be used only when natural light failed, opinions varied as to the relative merits of artificial daylight color and that of ordinary vacuum or gas-filled lamps.—

London Letter, *J. A. M. A.*, 95, 4: 276-277 (July 26), 1930.

**Progress Announcement: VI International Congress of Accidents and Industrial Medicine**—A meeting of the organization committee was held early in August, 1930, at which 13 were present from various countries. The honorary presidents and an honorary committee were selected, the former

comprising M. Albert Thomas of the B. I. T., Prof. Dr. Kaufmann of Zurich, Prof. Dr. Devoto of Milan, Sir Thomas Oliver, and M. Pometta.

The date of the Congress was set to begin August 3, 1931, at Geneva and to last 5 or 6 days. Membership is to be \$5.00 (in American money). The various nations are, or had been, invited to send official delegates. The exact title of the Congress was fixed for four different languages, the title hereof being that selected for the English language.

The committee for the United States so far accepted is comprised of Dr. Francis D. Donoghue of Boston, Mass., Dr. Emery R. Hayhurst of Columbus, O., and Dr. Francis D. Patterson of Philadelphia, Pa. The personnel from 15 other countries was likewise announced.—Communication from the General Secretary, Geneva, Aug., 1930.

**Protection against Lead Poisoning in Germany**—The German Government issued an Order on May 27, 1930, relating to the protection of workers engaged in house-painting against the risks of lead poisoning.

The order prohibits the use of white lead, sulphate of lead and products containing these pigments in the internal painting of buildings whenever the quantity of lead contained exceeds 2 per cent. It requires protective measures against the inhalation of lead dust during the work of scraping paint. It prohibits the employment of women and young persons under 18, other than apprentices and journeymen painters, and requires the provision of lavatories and cloakrooms, and the posting of a copy of its provisions and of a warning against lead poisoning therein. It also gives to inspectors the right to require a medical inspection whenever they deem it necessary, and compels the employer to provide for the medical supervision of the staff if it exceeds 5 persons.

The doctor has the right to require

any worker showing symptoms of poisoning to cease work until he is completely cured. Medical inspection on engagement is compulsory, and the workers must be informed of the risks they incur. On the advice of the doctor, any worker for whom the nature of the work constitutes a danger must be excluded from tasks involving risks of poisoning. In undertakings of a certain size the employer must keep a health register, open to examination by the inspectors.—*Indust. & Labour Inf.*, 35, 1: 54 (July 7), 1930.

**Health Regulations in Bolivia**—A Presidential Decree of June 3, 1929, lays down measures for the protection of the workers' health in industrial establishments in Bolivia.

The General Directorate of Health is entrusted with the control and supervision of health and safety in all the industrial establishments of the Republic without exception; it will draw up regulations regarding industrial hygiene, protective devices for machinery, lighting, ventilation and other measures for the protection of the workers against dust, vapors and industrial accidents.

A register will be kept in each industrial establishment, in which the health authority will enter observations relating to the protection of the workers' health; these observations must be compiled with within a fixed time limit.

Representatives or proprietors of industrial undertakings are required to send to the General Directorate of Health a complete monthly list of sick workers, specifying the nature of their sickness, and also the names of those workers who are habitually in a state of intoxication. These lists will be considered confidential, and the General Directorate of Health may not make any use of them other than of an educative nature. In the event of industrial undertakings paying no heed to the instructions of the General Directorate

of Health, the latter will have the necessary improvements carried out at the expense of the proprietors.—*Indust. & Labour Inf.*, 34, 8: 282 (May 26), 1930, taken from *Boletín de la Dirección General de Sanidad Público*, La Paz, Aug., 1929.

**Carcinogenicity of Oils**—The Manchester Committee on Cancer reports that two of the largest oil producing companies in the world have recognized the importance of discovering a safe lubricating oil at reasonable cost and are assisting the committee's staff in its investigations.

From experiments made it would appear that carcinogenic compounds begin to be formed between 500° and 600°, the maximum yield lying between 800° and 900° C. A synthetic tar containing the carcinogenic principle has been made, such that a 5 per cent solution was found to be more effective in producing cancerous growths than shale (petroleum) oil, the most dangerous commercial oil, but it has now been found possible to produce tars at least 100 times as powerful as shale oil. It was found that applying petroleum oil five times instead of two per week increased the carcinogenic potency fifty-fold.

The staff found that olive oil, neats-foot oil and sperm oil were non-cancer producing and they have reason to suppose that natural skin fat is an important factor in the prevention of experimental cancer. Thus lanoline applications alternated with synthetic tar applications delay the development of tumors. Where lanoline is applied twice as often, cancer does not appear, the protection afforded by alternate applications being much less marked.

The committee is now investigating the amount of sulphuric acid "washing" necessary to detoxicate petroleum oils and render them harmless as carcinogenic factors.—Unsigned, *Brit. M. J.*, 3615: 750 (Apr. 19), 1930.

**Lead Tetraethyl in Motor Spirit**—Among interesting features of the final report of the Departmental Committee appointed by the British Minister of Health, who inquired into the possible danger to health arising from the use of lead tetraethyl in motor spirit, are the following:

Though new and more refined methods for detection of lead in the urine were devised, no reason for disagreement with the results of the American inquiry was found, namely, that comparatively larger quantities were excreted by town dwellers and more still by workers exposed to special risks, excretion of lead being caused partly, if not mainly, by inhaling dust containing lead, involving a fairly close relation between the degree of exposure to lead and the proportion of lead in the urine. The average amounts found were 0.04 mg. per liter.

The lead content of settled dust in streets and garages was investigated by sampling in London and neighboring country districts, and the proportion yielded varied within the wide limits of nil to 3.3 per cent. The committee hold that the risk of chronic lead poisoning from daily inhalation of fumes over a long period is remote, the lead content of the dust in garages having been found greatly inferior to that in factories using lead.

It was likewise deemed improbable that pedestrians would inhale a dangerous quantity of lead escaping from exhaust pipes of cars during acceleration, while the risk from absorption of lead tetraethyl owing to contact of ethyl petrol with the skin is considered so slight as to be negligible.

No legislative action is advised by the committee, but special precautions are outlined to be followed by proprietors and vendors.—*Indust. & Labour Inf.*, 36, 8: 278–279 (May 26), 1930, taken from *Brit. M. J.*, 3614: 712 (Apr. 12), 1930.

# FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

**The Fat-Soluble Vitamin of Milk**  
—Reference is made to the report a number of years ago of the observations that apparently fat-free milk promoted growth in animals; furthermore, that other investigators had reported a deficiency of vitamin A factor in washed butterfat, all indicating the possibility of a vitamin A factor in the milk other than in the fat.

Short-horn cows furnished the milk which contained 3 per cent fat, and 12.05 per cent total solids. The milk was concentrated at a low temperature to water content of 22.15 per cent. The separated milk containing 0.1 per cent fat was concentrated to a water content of 32.75 per cent. The separated cream was churned and the buttermilk concentrated. To determine vitamin A butter was fed in daily doses of 0.1 gm., 0.2 gm., and 0.6 gm., and in the whole milk and in the skim milk plus buttermilk vitamin A was determined by administering doses of the former approximating one-half those of the butter and in the latter mixture in amounts somewhat greater than the amount of butter given. In addition, the basal diet was fed *ad lib*.

To test vitamin D a special diet was devised and observations were made by the increase in weight produced by the addition of vitamin D in this diet, free from this vitamin but otherwise adequate. Growth curves of the animals on the skim milk plus buttermilk were more or less proportional to the residual fat present, a marked difference being noted between the minimum, 0.016 gm. residual fat, and the maximum, 0.066 gm. In the latter case the growth approximated that with 0.1 gm. of butter, in-

dicating the minimum dose of milk fat somewhere between these quantities. The same ratio of growth to butterfat content was noted in those rats fed the whole milk.

While results with vitamin D were not so satisfactory owing to the limitations of the method, the conclusion is drawn that this vitamin is associated with the milk fat since the growth promotion on the skim milk was proportional to the amount of residual fat.

The analysis of the femurs of these rats indicated the ash-organic bone residue ratio to be proportional to the amount of milk fat, the optimum being obtained on a daily dose equivalent to 0.2 to 0.6 gm. butter.

It is concluded that both vitamin A and D in milk are associated with milk fat and no more concentrated in one fraction of the fat than in another. There is no appreciable loss in either vitamin due to separating or churning.  
—Margaret Emily Frances Crawford, John Golding, Edith Olga Veronica Perry and Sylvester Solomon Zilva, *Biochem. J.*, 24, 3: 682, 1930.

**Brucella Abortus in Certified Milk**  
—*Brucella abortus* has been demonstrated in samples of raw milk by inoculation into guinea pigs by many investigators. Evans, however, in 1915, successfully demonstrated the organism by plating methods. Hasley has shown that *B. abortus* can be isolated from certified milk on plates by using varying amounts of milk spread on poured liver agar (Stafseth) plus gentian violet in a dilution of 1:200,000 placed in an atmosphere of 5 per cent CO<sub>2</sub> and incubated for 3 days at 37° C. *B. abor-*



tus was grown from 10 of the 230 samples examined. The highest number of organisms found was 8 per c.c. of milk and the average was 2 per c.c.—D. E. Hasley, *J. Infect. Dis.*, 46: 430 (May), 1930.

**The Calcification of the Lung in Healthy and Tuberculous Rabbits with Large Doses of Irradiated Ergosterol**—Following researches on the calcification produced by irradiated ergosterol, these authors have determined the calcium content of the lung in 4 groups of rabbits: (1) normal rabbits, (2) normal rabbits treated with irradiated ergosterol, (3) tuberculous rabbits, and (4) tuberculous rabbits treated with irradiated ergosterol.

The ergosterol in oil was administered by various means but the most advantageous was found to be through the mouth. Furthermore, doses were sought which would prove calcifying but not too toxic whether using slightly irradiated ergosterol (45 minutes) by mouth, or strongly irradiated (6 hours) by other channels.

At death the lungs of the animals were ashed and calcium determined, figures being reported on pulmonary tissues dried at 100°. Comparisons of calcium of the thoracic and abdominal aortas were included. In normal rabbits the lung calcium varied between 0.10 and 0.15 gm. per 100. In the rabbits receiving ergosterol this figure varied from 0.42 to 2.06 gm. per 100.

The rabbits were inoculated with a known type of bovine bacillus of tuberculosis. In their defense against the tuberculosis and accompanying pneumonia there was an apparent attempt to calcify the bacillary lesions, but the infection was so great as to finally carry off the animals. In the lungs of 3 which lived 50, 82, and 87 days, the calcium was found to be 0.16, 0.68, and 0.67 per 100. In the case of the tuberculous rabbits with ergosterol, calci-

fication ranged from 0.19 to 0.68 per 100 of lung calcium.

According to the figures, irradiated ergosterol in normal animals can increase the rate of calcification of the lung from 1 to 20. The tuberculous rabbit can by natural means increase by 5-fold the original calcification but with appropriate doses of ergosterol sufficiently irradiated but nontoxic it is possible to increase this figure of lung calcium from 1 to 80.

Even though these animals succumbed to the experimental tuberculosis, attention has been drawn to the importance of calcium as aiding in a certain measure the defense of the organism. It remains to be seen if in mild or chronic cases this calcification can retard or check the development of tuberculosis.—H. Simonnet and G. Tanret, *Compt. rend. Soc. de biol.*, 190: 1526 (June 23), 1930.

**Comparative Studies of the Influence of Acid-Forming and Base-Forming Diets on the Metabolism of Rats**—Most of the diets recommended by pediatricians for infant feeding are calculated to be acid-forming, while the daily requirements for growth indicate a preponderance of basic elements in inorganic constituents. For this reason experiments were undertaken on the feeding of rats to determine the effect of these elements on infant metabolism.

Young rats between 30 and 35 gm. were used and were maintained on natural foods on which the acid-forming and basic elements were determined. Analyses of the blood of the two groups were made at the end of the 28th week and in addition to the pH value the inorganic radicals determined were CO<sub>2</sub>, Cl, P, and Ca. The organic determinations included sugar, cholesterol and protein.

The result of the acid-forming diet was reduction in serum phosphorus, to-

tal alkali reserve and the pH value with a rise of chloride, sugar and cholesterol. Converse changes followed the base-forming diet.

Histological examination of bones indicated a development of rickets in the acid diet. On the base-forming diet there were no thoracic deformities, the extremities were large and firm although the cell structure showed some resemblance to rickets. Analysis of the bone indicated a preponderance of ash on the base-forming diet. Animals on the high base diet showed greater average gain in weight than those on the acid diet. Weight curves show definitely these marked changes.

The protein in each group remained constant when the pH of the "basic" animals was on the alkaline side and of the "acidic" animals on the acid side of 7.4. The fat content in its degree of unsaturation as evidenced by the iodine number apparently was uninfluenced by the proportion of acid and base element. The fact that base-forming foods increased the weight while an opposite result obtained with an acid diet is discussed on the theory of the electro-negative charge of the protoplasm at pH 7.4, requiring for its maintenance in solution electropositive ions. While definite conclusions could not be made in the case of infant feeding as a result of

this experiment evidence seems sufficient to warrant a consideration of these principles in practical infant feeding.

It is probable that a mineral deficient diet such as is found in refined cereals may be compensated by adding fruit and vegetable juices and as a defense against rickets the basic diet favors the retention of calcium and phosphorus. Basic-forming food is also an advantage in correcting the acidosis due to acute infections and gastrointestinal disturbances.—Emma Louise Samuel and I. Newton Kugelmass, *Am. J. Dis. Child.*, 39: 687 (Apr.), 1930.

On a Possible Preparation of a Highly Active Ergosterol (Vitamin D) from Raw Coffee—A substance can be obtained from raw coffee and in very small amount from roasted coffee as a constituent of the unsaponifiable matter of the fat, which gives the spectrum of active ergosterol. The substance loses its activity in several weeks. On rats made rachitic by McCollum's diet, 3,143 therapeutic and prophylactic studies showed the ergosterol to have curative and protective properties. The article includes technical comment on the handling of experimental animals for Röntgen photography.—L. Schwarz and F. Sieke, *Arch. Hyg.*, 104: 65 (Aug.), 1930.

# PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.\*

**Who Is a Public Health Nurse?**—The *Board Members' Manual* gives the following definition of a public health nurse:

The term public health nurse applies to any graduate nurse who is taking part in an organized community service to individuals and families, including the interpretation and application of medical, sanitary and social procedures for the correction of defects, prevention of disease and the promotion of health, and may include skilled care of the sick in their homes. Formerly, the term "visiting nurse" referred to the nurse whose chief activity was bedside care, and "public health nurse" to the nurse whose principal efforts were educational. The term public health nurse, however, has come to include both groups of nurses, and is so used in this manual.

In the *New York State Health News* for July 7, 1930, a few outstanding points about the public health nursing movement, prepared by Ada Newman of the Wisconsin State Board of Health for the U. S. Public Health Service, help to explain several phases of public health nursing:

Public health nurses are found in large numbers in the original task of caring for the sick in their own homes. These nurses are graduates of 3-year hospital training courses and were either taught visiting nursing by the staff school or took a postgraduate course.

The next largest service of the public health nurse is that of school nurse. She assists the health officer in communicable disease control, aids the school physician in examination of school children, and makes home visits to interpret the findings and advice of the physician to the parents.

Public health nursing is recognized not only from a humanitarian point of view and as an educational force, but also on the basis of com-

mercial value. This is demonstrated by the fact that business concerns employ nurses in large numbers, believing that in order to have their plants operate on a more efficient basis, the health of the employees and of their families should be protected. Insurance companies also employ many nurses to work among their policy holders. When we consider that the only motive back of industrial nursing is a financial saving for the employing body, it speaks very highly for the economic value of such service.

The latest nursing activity to be developed in the United States is rural community nursing. These rural programs are planned to cover in part health educational work for the adult and for the school child, infant welfare, and the prevention of communicable diseases; in short, all phases of nursing service.

Mary S. Gardner's book *Public Health Nursing*, which is recognized as the standard textbook on public health nursing the world over, has listed in the table of contents under "Special Branches of Public Health Nursing" the following: Tuberculosis, Child Care, School, Mental Hygiene, Industrial, and Venereal Disease.

The National Organization for Public Health Nursing, with headquarters in New York, is recognized as the standard making body in the public health nursing field. It is a member of the National Health Council and advises and assists the American Public Health Association through its Committee on Administrative Practice in matters of policy and administration, and in field studies where public health nursing is concerned. This organization has industrial, school, tuberculosis and social hygiene specialists on its staff, and has been mainly responsible for the great number of visiting nurse associations

\* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

which have sprung up in this country since its establishment in 1912.

It might almost be said that any graduate registered nurse who is doing nursing other than institutional or private duty nursing, or who is a physician's office assistant, is a public health nurse, and Annie Goodrich says that every graduate nurse should be a public health nurse in that she teaches health to the public.

**Supervision**—A very good definition of supervision is that made by Fannie Dunn of Teachers College: "Instructional supervision has the large purpose of improving the quality of instruction, primarily by promoting the professional growth of all teachers, and secondarily and temporarily by correcting deficiencies of preliminary preparation for teaching by training teachers in service."

Supervision does four things:

1. *Inspection*—The old idea of supervision was inspection alone. It was catching the worker and watching his deficiencies.

Today inspection is still necessary in supervision to gather the facts, "to know the situation, particularly the weaknesses, deficiencies and possible betterments."

2. *Training*—If this is to do any good there needs to be a definite program for it over a definite period of time. Inspection reveals what the nurses need, and training is definitely directed to the supplying of these needs.

A training program should be two-fold. The aim is to improve the worker in the direct performance of his everyday work, and also in a more general way by means of suggesting supplementary reading and by organizing conferences.

3. *Guidance*—By this is meant that the better teachers are stimulated to experiment, and to help plan the program of supervision by giving the supervisor practical suggestions. They are also inspired to "look for promotion, and further training and advancement." This implies "developing and maintaining morale, professional spirit, *esprit de corps*." Since it takes great leaders to bring out more than average work among the workers this development of morale is one of the finest contributions the supervisor can make to her staff.

One of the methods of developing this mo-

rale is to "maintain a personal attitude which is fair, sympathetic, kindly and tolerant." Another method is to help willingly and happily when help is needed. The last way is for the supervisory staff to know their stuff so they can help.

4. *Research*—A good supervisor should be open minded enough to be willing to try out new things in order to find better ways of doing the work in hand.

There are four other points which show the contrast between the new and the old supervision:

1. The new supervision is continuous, not piecemeal, and is not confined to visiting and conferring with the worker himself.

2. "Traditional supervision was inspection. Today it is help and assistance and encouragement."

3. The old supervision was done by one person. Today good supervision implies several different supervisory contacts just as several judges are better than one.

4. "Supervision today is not authoritarian. It develops out of the need of the workers under supervision." There are several reasons why the new supervision has come into use:

a. "It is an accepted business principle in many business corporations."

b. "The average worker in any field is not a highly trained individual," and needs supervision to move towards the ideal.

c. Even a highly trained worker cannot keep up with the new developments in the field. "She has to have an agency, a supervisory staff which reads, digests, and corrects the new material to the level of the classroom worker."

W. H. Burton, Ph.D., *Supervision, Am. J. Nurs.*, XXX, 8: 1045-1051 (Aug.), 1930.

Every public health nurse will know on reading this article that although Dr. Burton speaks from the point of view of a teacher, every point he makes applies perfectly to supervision in public health nursing, because every public health nurse is a teacher. There has been a great deal said and written the last few years about staff education in every public health nursing organization. And surely any one getting these points in Dr. Burton's paper will see the need of staff education and the opportunities that it presents, both to the supervising nurses and to the staff.

**For School Nurses**—Scales have a very definite part to play in the school health program as an educational means of interesting children in health and health practices. Emphasis is now placed upon gain in weight instead of on underweight status. A child failing to gain for several months is abnormal and should receive medical attention.

Several studies have brought about this shift of emphasis. The Massachusetts State Department of Public Health found after examining 50,000 school children in that state that one-third of the children who were pulmonary cases were not underweight, and one-fifth of the latent tuberculosis cases found in the contact group were in normal or overweight children. They concluded that children exposed to an open case of tuberculosis are infected with the tubercle bacillus to the same degree regardless of nutrition or nationality.

Dr. Raymond Franzen of the American Child Health Association after a school health study concluded that height is insufficient skeletal information to use as a basis of weight classification.

The Massachusetts State Department of Health in their 10-year program for discovering children with some evidence of tuberculous disease now give all children a tuberculin test, and those who react positively are X-rayed. If the X-ray film shows evidence of tuberculosis or other pulmonary conditions the child receives a thorough physical examination by the state physician. In this way it is estimated that 50 per cent or more of tuberculosis cases in adult life can be picked out of the 10 per cent of children who are shown by the X-ray to have been infected.—Louise Strachan, *What Do Scales Weigh? School Life*, XV, 9: 178 (May), 1930.

## EDUCATION AND PUBLICITY

EVART G. ROUTZAHN\*

**An Attractive Annual Report**—The 1929 report of Palama Settlement of Honolulu is unique. The pages are in groups of three different sizes and bound terrace fashion, each "terrace" dealing with one phase of the work, namely, Community Service, Nursing and Medical, Recreation. Several of the statistical tables are presented in the form of ingenious picture graphs. Line drawings brighten most of the pages. The chapter "One Day with a

Palama Health Nurse" sketches a typical day's experience from 8:00 A.M. to 4:00 P.M., which is an excellent way of visualizing for the layman a more or less intangible service. Philip S. Platt is director of Palama Settlement.

**Quackery and the Spotlight**—Modern health education, with its emphasis on the positive aspects, is supposed automatically to neutralize ignorant deductions and false teachings. Yet it is the interest created by legitimate health education that feeds the quacks. A direct attack on chicanery is a part of health education.

Health Commissioner Shirley W.

\* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y., who will return from Europe in time for the November JOURNAL. Dr. H. E. Kleinschmidt has been in charge of this department for September and October issues.

Wynne of New York City undertook some months ago to rid the radio of medical and health swindlers. Through the coöperation of local radio stations, he succeeded admirably, but local restrictions curtailed his ambition to sweep clean. Therefore, he advocated the compilation of an "Index Expurgatorius" for the guidance of broadcasting stations everywhere and appealed to the National Better Business Bureau for help. That organization, after more than 6 months' labor, classified a "Rogue's Gallery" of some 25,000 medical quacks, nostrum manufacturers and peddlers, diet inventors and other vultures.

The mellow, lifegiving sunlight of health education needs to be supplemented by the harsh spotlight of pitiless publicity.

**When Is an Exhibit?**—Every summer national health agencies receive appealing letters saying "I have been allotted space for a health exhibit at Blank County Fair. Please send me some good material." Generally Oscar, the office boy, mechanically rolls up an assortment of posters and sends them on. In due time these find their way to the booth with sundry unrelated posters elbowing each other for breathing space. But nobody cares!—except the genial chairman who says the exhibit is "nice."

According to the *Ohio Health News* of August 15, 1930, the Ohio Department of Health intends actually to "exhibit" its work at the state fair. Each departmental division is preparing a unit designed to tell John Jones what that division is doing and how it touches his life. For example, the unit on Roadside and Camp Sanitation will consist of models showing the proper installation of power and hand operated pumps. Experienced attendants will be on hand with a specially prepared pamphlet on the work of the depart-

ment. We assume that the mosaic will be put together by a skilled showman, and we hope the effort will demonstrate what a real exhibit can be.

**Precept Plus Example**—A certain school principal insisted on serving coffee in the cafeteria in preference to milk because it was more economical. Meantime, the teaching staff were daily emphasizing the virtues of milk. So writes Dr. Phair, chief school medical officer of Ontario, who pleads for better correlation between preaching and practice. The best way to stimulate actual interest in personal health in the pupil-teacher is to provide a well rounded system of health service in the normal school. Such service improves the health of the future teacher and "carries with it the conviction of practicability." In addition, of course, the normal school should offer thorough training in the principles of health and the technic of teaching these principles. Dr. Phair's article, "Health Teaching in Normal Schools," was published in the *Canadian Public Health Journal*, May, 1930.

**A Health Text Book**—The Milwaukee Health Department issues an alluring textbook on "Home Hygiene and Care of the Sick," which is used to supplement class periods conducted by the department at social centers, settlement houses, and schools. Each of the twenty lessons is preceded by a brief statement of its aim and followed by a number of provocative questions. The instructions given are simple and practical. If bits of useless knowledge, such as how to make a mustard plaster or the advice that the sick attendant should not wear jewelry, seem to burden the book, that may be charged to this guest editor's harmless prejudices.

The book elicits comment in these columns because it is a very creditable home-made job. It was printed in the health department office by multigraph.

The sheets are of letterhead size on very heavy yellow-tinted stock. Only one side of the sheet is printed. This makes the book somewhat bulky. The sheets are bound with metal staples and covered with a cardboard stock of soft, marble-like tones.

It would be interesting to learn how the cost of production of this booklet would compare with a professional printing job. Its individuality, however, gives it a value which would be difficult to appraise. The Milwaukee Health Department offers a limited number to our readers free of charge. Write early.

The Milwaukee Health Department also prints in the same style a smaller manual on preschool clinics. Here both sides of the sheet are printed. The type does not press through and the effect is very neat. A limited number of copies free for early askers.

**Jazz Typography on the Skids—**J. L. Frazer, whose typographic judgments are recognized to be authentic, has for some time swung his cudgel against "modernism" in type. He uses the term in its commonest meaning; i.e., synonymously with "jazz," and believes the wave of bizarre typography in advertising is receding. *The Inland Printer*, of which Mr. Frazer is editor, restates in its August, 1930, issue eight typographical abominations which every user of type should shun:

1. Illegibility through the use of overblack and complex faces of type
2. Ugliness from the use of eccentric types
3. Ugliness through the combination of unrelated forms constituting an assault on common good taste
4. Geometrics as commonly applied in layouts and as also indicated in the excessive use of black patterns of varied shape which dis-

grace the name "ornaments" and keep the mind off the message in type

5. Excessive and excessively heavy rule work that, like other jazz features, tends to increase the cost of composition while placing a handicap upon readers which most of them will not attempt to overcome

6. Setting lines aslant, in curves, and vertically, instead of horizontally, as they are read

7. Illustrations which, like much modernistic typography, must be studied out

8. Composition sans capitals which disregards the part they play in denoting important words and making print more readily comprehended

Let the health publicist who creates printed matter and prescribes type and layout take notice!

**Good Ideas—**For a sample of attractive mimeograph work see the *Bulletin* of the Middletown (N. Y.) Board of Health. The July, 1930, number is a model of neatness and attractive arrangement. The illustrations are apt and exceptionally well done. It was prepared and mimeographed by Mildred Gillistin.

"My Daddy is the Health Commissioner" is the head line of a little poster illustrated by a series of six portraits of a charming little miss who tells how and why she was protected against diphtheria. It is issued by the Racine Department of Health. The department also uses a milk bottle collar as well as folders promising the people that "we are going to knock out diphtheria." Samples of this material may be obtained by applying to Dr. W. W. Bauer, Commissioner of Health, Racine, Wis.

**They Say—**

"No serum has done so much for public health as printers ink."—*Wis. Med. J.*

"Early Diagnosis or Early Grave."—*Health Briefs*—Tenn. Dept. of Health.

## BOOKS AND REPORTS

Harvey W. Wiley. *An Autobiography—Indianapolis: Bobbs-Merrill, 1930. 339 pp. Price, \$5.00.*

The recent death of the author at the ripe age of 86 years adds interest to his life story. He was born on a farm in Indiana, received his early education in the "old log school house," served in the Indiana Legion during the Civil War, later entered Hanover College, and finally graduated in Medicine from the Indiana Medical College in 1871. During his studies he discovered a special liking for botany and chemistry. A year after graduation he became a teacher of chemistry in his Alma Mater, and to prepare for this task, went to Harvard, where he came into contact with some of the great men of that time. For 9 years he taught chemistry at Purdue University, during which his interest in foods, their relation to health, and their adulteration increased steadily. In 1883, he went to Washington as Chief of the Bureau of Chemistry in the Department of Agriculture, a position which he held for 29 years.

Dr. Wiley's life was full of interesting events, but he will always be best known on account of the strenuous and prolonged struggle he made for the betterment of foods and the prevention of adulteration. This brought him into conflict with certain presidents, vice-presidents, cabinet officers, and appointed officials, to say nothing of the number of manufacturers who sought for years to get his scalp. The history of his fight for pure foods is one of the most heartening in the scientific annals of our country, and the part played by administrative officers, from certain presidents down the line, is one of the most sickening. Finally, Mr. Wickersham, then Attorney-General under

President Taft, and now chairman of one of Mr. Hoover's many Boards, made charges against him of having conspired to defraud the government, and certified to President Taft that he was worthy of dismissal and "condign punishment." He was completely exonerated, and it will always be to President Taft's honor that he supported Dr. Wiley in his protection of the public.

He married when he was 66, and soon after, 1912, resigned from the Service. The union was blessed by two sons. The later years of his life were spent in giving public addresses on the Pure Food Laws, and doing editorial work for *Good Housekeeping*.

Dr. Wiley will always be known as a friend of the people and the Father of the Pure Food Laws of our country. It is interesting to note that almost coincident with his death, there is a scheme on foot by the present Secretary of Agriculture to allow adulteration with corn sugar without the fact being stated on the label.

The book is written in interesting style, and with the volume by the author which preceded it by a short time, *The History of a Crime Against the Food Law*, should be in the library of everyone who is interested in nutrition.

M. P. RAVENEL

**Infant Nutrition. A Textbook of Infant Feeding for Students and Practitioners of Medicine—By Williams McKim Marriott, B.S., M.D. St. Louis: Mosby, 1930. 375 pp. Price, \$5.50.**

Proper nutrition is essential to good health at all ages, but it is particularly important in the crucial first years of life. Infant mortality is diminished when babies are competently fed with



pure milk products, administered by informed mothers under the direction of skilled physicians. This book should do much to assist practitioners in acquiring the scientific principles of infant nutrition. Out of an extensive clinical experience the author has produced a thorough, clearly expressed, logically arranged, and well illustrated work, which seems to contain all of the salient details regarding the feeding of well or sick infants.

In the 34 chapters of this book, the fundamental principles of infant feeding, such as the proper employment of the fats, proteins, and carbohydrates, the function of the vitamins and minerals, the technic of breast feeding, the requirements for artificial feeding, and the character of materials, are all set forth. An entire chapter is devoted to evaporated milk, and another to acid milk, both of which are much favored by this writer. Various physical disorders such as diarrhea, malnutrition, vomiting, colic, constipation, rickets, and other afflictions are also completely discussed in the various chapters.

This modern presentation of an important phase of public health ought to be of value to health officials and physicians who are directly concerned with baby clinics and infant feeding problems.

JAMES A. TOBEY

**Die Statistischen Methoden.** (Statistical Methods)—By *Karl Freudenberg*. Berlin and Vienna: Urban and Schwarzenberg, 1930. 558 pp.

This is one of a series of handbooks on method in biology, edited by Dr. Emil Abderhalden of Halle. It deals with descriptive and elementary analytical methods in medical statistics. Hence, on the side of subject matter, it includes what is commonly understood to be demography or vital statistics, some anthropometry, biometrics, certain branches of welfare economics, and other disciplines which do not ordinarily

find their way into the existing texts available to our American students.

The elementary analytical-mathematical methods described by Dr. Freudenberg are drawn from the literatures of England, Austria, Germany and the Scandinavian countries. There is even a short, but satisfactory, description of the major methods and results of life, health and accident insurance statistics.

Because of its comprehensive scope the work should serve as an excellent first book for students of vital statistics. In many of the chapters, Dr. Freudenberg has brought his data down to 1928. The bibliography includes the accessible and pertinent texts on medical and social statistics in the German language. Unfortunately, the table of contents and index will not be available until the other parts in the hygiene handbook of the series are bound. A few descriptive table headings would have added to the usefulness of the book. Table heading technic seems to be faulty in most German and French statistical texts. Dr. Freudenberg has recently contributed to the *Journal of the German Society for Insurance Science* an attractive article on "Statistics and Causality" (March, 1930). Vital statistics and the personal insurances seem to be more closely allied in Germany than in other countries.

If one agree with certain Europeans that statistics is the art of reaching clear and profound conclusions from numerical data pertaining to a given field of interest, and gathered for this purpose (*Carl Burrau* in "Grundzüge der Versicherungsstatistik"), then Dr. Freudenberg's book promises to reward the student with an understanding of elementary "statistical method."

The text is not difficult to read, and the publisher has provided an attractive Roman type face. The book should find readers among vital statisticians in the United States; in a sense, it will be found to have antidotal properties.

E. W. KOPF

A Textbook of Hygiene—By J. R. Currie. New York: Wood, 1930. 844 pp. Price, \$8.50.

We owe to England the great modern awakening in public health, and in many respects she still leads us in this branch of medicine. English books have some drawbacks for American readers, but the fundamental principles of hygiene are always the same, their application being modified by the surroundings. Therefore, one can read English books with pleasure and profit.

The aim of the author has been to meet the requirements of students in hygiene and public health under the medical curriculum, and at the same time to assist candidates in Parts I and II of the examination for the diploma in public health or degrees in sanitary science. We believe that he has succeeded in fulfilling his object in an unusually good manner.

Each section is followed by a statement of the legal enactments involved for England, Scotland and Wales. These laws do not interest the American reader particularly, though they may well be studied by our health authorities, and in many instances imitated. While the author distinctly disclaims any attempt to deal with the whole domain of hygiene, or to cover the field of modern public health administration, he has in an excellent fashion selected the important points for the students especially, but also for the practitioner who wishes to keep posted on the modern advances in sanitary science.

All of the subjects usually covered in such a volume are taken up in order and adequately treated. The sections on Food, Infectious Disease, and Helminthes, Insects, and Arachnida, are especially good. There is also an excellent section on Port Sanitary Administration, which has always been of especial importance to England on account of its enormous shipping and the significance of which has increased in all

countries with the passing of the sailing vessel and the substitution of steam.

The book can be thoroughly recommended as one of the best in its class. The illustrations are abundant and good, and the printing and general make-up excellent.

M. P. RAVENEL

Essentials of Pediatric Nursing—By Ruth Alice Perkins, R.N. Philadelphia: Davis, 1930. 364 pp. Price, \$2.75.

The material in this book was arranged to meet the requirements of the course in pediatric nursing suggested by the National League of Nursing Education in the last edition of the curriculum.

Because of increasing interest in the study of the normal child, orthopedic and communicable disease nursing are omitted—since these are now given in separate courses—and extra time is devoted to principles of child psychology and to the care of the normal child.

There is an excellent bibliography, and questions and problems, brief but to the point, at the end of each chapter which a busy teacher will greatly appreciate, as she will also the Teaching Supplement in the back, which gives outlines of courses to be given by the supervising nurse or medical staff or both. As Joseph Brennemann, M.D., says in the foreword, the book is "safe, sane, and sound."

The typing is somewhat pale, but the material is well arranged with good topical headings. The illustrations are fairly plentiful and good, some of them in colors.

EVA F. MACDOUGALL

Man vs. Microbes—By Nicholas Kopeloff. New York: Knopf, 1930. 311 pp. Price, \$5.00.

To encompass within a volume of moderate size a comprehensive knowledge of all those minute forms of animal and plant life which are correctly but too seldom termed "microbes," and to do this in a style which shall be so en-

gaging that the popular mind will be instructed while being entertained, is the difficult task which the author has set himself.

How well he has succeeded will be a matter of opinion, for there will be some who will feel that science binds itself awkwardly to the particular kind of treatment which is here employed. Not every one wishes the modernistic method.

The title and some of the text suggest that man is at perpetual war with the microbic world, but there are places in the book where the author is at pains to explain that this is not so and that, in fact, some microbes are very useful while others are indispensable, that without them human life on the earth would be entirely impossible.

Where the matter has not been touched up to make it striking or amusing it is admirable. The author has taken a great deal of trouble to bring so much intrinsically interesting and useful information together.

A book of this scope is needed by every health officer. Schools and public libraries ought to have it. It will broaden the minds of those who read it, for its scope is broad. It is crammed with the knowledge with which man's relations with the microbes, good and bad, are carried on.

He who wishes to get the latest and best facts about the infectious diseases in the making of beer and wine and bread will find the book useful.

G. A. SOPER

**A System of Bacteriology in Relation to Medicine—Volume II—By C. H. Browning, W. Bulloch, J. H. Dible, A. Fleming, F. Griffith, et al. London: His Majesty's Stationery Office, 1929. 420 pp. Price, \$6.00.**

Volume II of this 9-volume *System of Bacteriology*, sponsored by the Medical Research Council of England, deals with the cocci and the hemophilic bac-

teria. The first 5 chapters include the staphylococcus, the streptococcus, the pneumococcus, the gonococcus, and the meningococcus. Chapter 6 is devoted to the influenza group of organisms, while chapter 7 is a short presentation of whooping cough and *Bacillus pertussis*, chancroid and *Bacillus ducrey*, conjunctivitis, *Bacillus lacunatus* and other organisms.

In general, each chapter covers: history, morphology, cultivation, biochemical reactions, vitality, distribution, pathogenicity, resistance, classification, and treatment. The organization is such as readily to permit assimilation of facts.

One hundred and thirty-four pages are devoted to the streptococci. They are presented under four main divisions—the hemolytic, the mouth, the bowel, and the anaerobic streptococci. An excellent table is given which summarizes the characteristics by means of which the mouth streptococci can be differentiated from other streptococci and the pneumococci. The diseases related to streptococcal infections are presented.

One feels grateful for the clear presentation of the confusing literature on the serological races of pneumococci. The account of the serums, vaccine, and chemotherapy of pneumonia gives the present incomplete knowledge of their efficacy, and the problems still to be solved before definite conclusions can be reached.

The chapter on the influenza group of organisms, of which *B. influenza* (Pfeiffer) is the most important member, includes those organisms which require for permanent cultivation on artificial mediums accessory substances present in blood and in fresh vegetable tissue. After discussing the etiology of influenza the author concludes:

It is obvious from all that has been said that, at present, the diagnosis of influenza by bacteriological methods has no sure foundation. Neither the apparent absence nor the

finding of the influenza bacilli in the respiratory passages gives an unequivocal answer (p. 374).

Each chapter includes a good bibliography. This volume will be of great value to the student and research worker as well as to the practitioner who desires to remain correctly informed as to the bacteriological advances that have been made concerning these organisms in recent years. ESTHER W. STEARN

**Military Preventive Medicine—***The Army Medical Bulletin, No. 23—By George C. Dunham, M.D., Dr.P.H., Major, Medical Corps, U. S. Army. Medical Field Service School, Carlisle Barracks, Pa., 1930.*

The fundamentals of hygiene and preventive medicine are, of course, the same under all conditions. The medical officer in an army camp suffers from certain disadvantages, but is in some ways much better off than his brother in civilian life. On the other hand, we have large numbers of men, drawn from extensive areas, rapidly brought together, bringing with them various contagious diseases from the many sections which they represent. The military officer is more or less independent of local laws, and has absolute control, though sometimes hampered by long-distance, machine-made regulations issued from Washington by some incompetent swivel chair endurance sitter. While the contact is often much more direct and more close than in civilian life, control is more easily carried out.

The great point which is emphasized by a book such as the one before us is that all officers of the Army, medical as well as line, and the people in general have come to realize that the Medical Service of the Army is the agency upon which its efficiency largely depends. During the World War this was impressed on everyone. The saddest failure of England was the Mesopotamian campaign, in which the chief medical

officer was overruled and even threatened with court-martial by the line officer in command. At present, the medical officers of the Army are the most trusted consultants of the commanding officers.

The volume before us, consisting of 1,000 pages, exclusive of the index, which is good, is proof of what has just been said. It is written to provide the officers of the Medical Department of the Army with information which will assist them in their inspection and studies, and in carrying out measures to protect and promote the health of the troops. Especial attention is given to the epidemiological factors which exist among troops and to the environmental features met with under Army conditions.

Though the author states that he has made no attempt to cover the entire field of preventive medicine, it may be said that there are few subjects which have been left unconsidered. The disposal of garbage and human excreta of all kinds necessarily occupies considerable space, and excellent illustrations of the various types of emergency incinerators, folding and transportable receptacles, and knockdown latrine boxes are given.

The section on the control of vermin and insects is especially full and practical.

The book can be commended without reservation. The product shows that no better man than the author could have been selected for the task. Medical affairs in the Army advanced tremendously between the Spanish-American War in 1898 and the World War in 1917. Except for the epidemic of influenza, our Army showed a record which has never before been equaled in the world. The control of all diseases about which we had adequate knowledge was nothing short of marvelous.

The book is published by the government and is, unfortunately, not for sale. It is to be distributed to officers of the

Army, leading journals, schools and libraries in the United States. We wish that it could be put on general sale.

M. P. RAVENEL

**Children at the Crossroads—***By Agnes E. Benedict. New York: Commonwealth Fund, 1930. 238 pp. Price, \$1.50.*

Here is a book that will be of interest both to the optimist and to the pessimist. The one will see in it what can be accomplished by painstaking, resourceful effort in rehabilitating children who, for one reason or another, are on the wrong track; the other will be impressed by the time, the effort and money that must be expended to bring about the desired results.

Which of these two points of view is the sounder is, of course, a matter of opinion. There is no doubt, however, that this readable story of results accomplished by rural visiting teachers working under the Commonwealth Fund grant will stimulate thought on the part of all interested in the development of agencies to deal with the misfit child.

It will undoubtedly occur to the unregenerate while reading this book that much time could be saved if public opinion were not so slow and squeamish about dealing with the worthless parent, as in the case of Tim Noonan.

On the other hand, the thought may occur to those interested in administrative matters that much of the work of the visiting teacher as depicted here might well be that of the visiting nurse, the mental hygienist, or the social worker. Are we developing many different agents to do work which might well be done by one with a little adjustment in training?

I have said that this is a readable book; it is. A sufficient number of case histories are used to give vividness to the application of general principles to the specific problem of salvaging misfit children. "Getting Caught" sounds

like the title of a thriller but its application is found in a discussion of Community Factors in Maladjustment. Other chapters deal with The Rural Child at Home and in School, Visiting Teacher Work in a Rural Setting, and Group Work in School and Community.

A commendable feature of the book is its frankness; it discusses failures as well as successes.

MERRILL E. CHAMPION

**Science in the Service of Health—***By Elliot R. Downing, Ph.D. New York: Longmans, Green, 1930. 320 pp. Price, \$2.00.*

This is one of Longmans' School Science Series, edited by the author of the present volume. It is one of the many books written by laymen which have appeared during the past few years on subjects which are largely medical.

Practically it may be divided into two parts, the order of which, in our judgment, would better have been reversed. Six chapters are devoted essentially to bacteriology and its effects on the welfare of mankind. The remaining six chapters are given largely to the human body and its functions, but include such discoveries as the vitamins, insulin and the effects of the endocrine glands. An appendix is devoted to demonstrations to which reference is made in the several chapters.

The book is written in popular language; the facts are correctly stated; and a great deal of interesting history is given. There are some unfortunate misprints, as Detafond for Delafond, and Finley for Finlay. Some of the most interesting histories, like that of anthrax, for example, which was the first germ ever proved to be the cause of a disease, and the study of which has taught us much about bacteriology, are inadequate.

In general, the book belongs to the better class of its kind. The printing is excellent.

M. P. RAVENEL

**History of Haitian Medicine**—By Robert P. Parsons. *New York: Hoeber, 1930.* 196 pp. Price, \$2.25.

The medical history of Haiti since the American Occupation in 1915 vies with the history of the U. S. Army as an object lesson in what modern preventive medicine can do. This beautiful island, "The Flower of the Antilles," has been blessed in almost every way by nature, but was exploited by man with little regard for anything else than profit for many years. Slavery existed in the island for 292 years, during which every type of disease found in Africa was brought in and found there a suitable soil. There came also African superstitions, like voodooism, which hindered rational prevention.

Practically everyone in the rural population has suffered from malaria, yaws, and intestinal parasites. The Caribs disappeared during the period of exploitation by the Spanish, within 60 years; many of them were worked to death, many murdered outright, but most of them died from smallpox—some 200,000 within 10 years of the landing of Columbus in 1492.

Independence came to the island in 1804, at which time the French commanding general died of yellow fever, and the disease caused such ravages in his army that it was virtually defeated by that disease. Smallpox is apparently the only disease which was not introduced from Africa. This was brought by the whites.

Yaws, "the blood brother of European syphilis, if not the same disease modified by age incidence, social environment, and racial difference," was the great physical curse of Haiti, and until the advent of Dr. Wilson in 1922, its significance does not seem to have been recognized by anyone. Dr. Wilson insisted that the first need of rural Haiti was "soap, salvarsan and sunshine."

The National Public Health Service

of Haiti was organized by Captain N. T. McLean (M. C.), U. S. N. Others, like Drs. Laning, Ebert, Wilson and Butler, played a leading part in the redemption of the island. Among the Haitians, Drs. Dehoux and Audain deserve especial mention.

The author has performed his task in an unusually good fashion. The book reads like a novel. Apart from its inherent interest in telling of the redemption of a worthy people from disease, it should be in every medical library, and constantly quoted as an outstanding example of one of the great triumphs of modern medicine.

M. P. RAVENEL

**Personal Hygiene for Nurses**—By Seneca Egbert, M.D., Dr.P.H. *Philadelphia: Davis, 1930.* 347 pp. Price, \$2.50.

This book is written for student nurses to be used "at the beginning of their course in the training school." However, it is not so closely tied up with nursing that it could not be used just as profitably by college freshmen.

The book is sane and sound, and Dr. Egbert's approach to personal hygiene in Chapter III where he treats of the care of the body in its relation to the importance of an attractive personality is especially to be commended. The esthetic always has a strong appeal in presenting this subject to young women. Here charm is discussed from the point of view of posture, skin, cleanliness, bathing, the hair, and the teeth.

In later chapters on The Heart, Respiration, Excretion, Senses, Organs, etc., the author gets rather technical and uninteresting. Much more space seems to be given over to anatomy and physiology than to the details of personal hygiene as they apply to nurses.

In the chapter on "The Nurse as a Teacher" most public health nurses would smile at the paragraph in which the author says, "There are, however,

other branches of the profession than only that of the private nurse. Thus we have the school nurse, the public health nurse, and the industrial nurse." He evidently looks upon the rural or county nurse as the public health nurse, when he should include the school and industrial nurse as well in this category. Nothing is said about the additional training necessary to fit a graduate registered nurse to be a well qualified public health nurse.

An excellent series of questions follows each chapter and also a brief bibliography. EVA F. MACDOUGALL

**The Bureau of Home Economics. Its History, Activities and Organizations—By Paul V. Betters.** Washington, D. C.: The Brookings Institution, 1930. 95 pp. Price, \$1.50.

This belongs to the Service Monographs of the United States Government, No. 62. "The Brookings Institution—Devoted to Public Service through Research and Training in the Humanistic Sciences"—was incorporated on December 8, 1927, its first purpose being to aid constructively in the development of sound national policies, and the second to offer training of a supergraduate character to students of the social sciences.

The many bureaus of our national government and their overlapping have been the subject of many discussions, political as well as otherwise. The Brookings Institution, the full history of which cannot be here given, has been of notable service in telling the people of the country what is going on in Washington in the many bureaus and departments located there.

The Bureau of Home Economics was established July 1, 1923, before which many of the activities it now carries on had been administered in the Department of Agriculture. In the 7 years of its existence, it has grown from a small

investigational unit with a staff of 4 or 5 persons to an organization employing 71, and the appropriations have increased from \$71,760 in 1924, to \$167,500 in 1930.

As this is a concise and detailed description of the activities of the bureau, a review is hardly possible. The chief activities are Food and Nutrition Investigations, Textile and Clothing Research, Textile Utilization and Maintenance Work, Sewing Survey and Garment Fitting Study, and Economic Studies. An appendix gives the publications which have been put out from the bureau.

The study is wholly descriptive in character, and no attempt has been made to subject the facts to criticism, nor to indicate changes which might be made with advantage. The object is to enlighten the public and legislators as to actual facts—and as such, the book can be commended. M. P. RAVENEL

**Psychology for Executives—By Elliott Dunlap Smith.** New York: Harper, 1928. 262 pp. Price, \$3.50.

An interesting introduction by Henry S. Dennison of the Dennison Manufacturing Company, Framingham, Mass., where the author is Division Manager (he is also a Lecturer at Harvard University), states that learning how to manage men and how to work with them so as to get the best there is in them is of first importance to business men. The book is claimed to deal with psychology in the spirit of the engineer, and the author was a manager before he became a psychologist.

Seven chapters compose the body of the book:

I. Why Men Are and What They Are—the capacity of mankind to learn, how much is inborn and how much acquired, with a valuable discussion of "intelligence tests," and how far "human nature" can be changed.

II. Habits and How to Handle Them—developing by chance or by choice, with an

elaboration of ten precepts on correct habits.

III. Habit and Thought—memory and how to train it, the power of association, attention, etc.

IV. The Forces of the Personality—its multiplicity.

V. The Problem of Self-Control—rebellious desires, self-deception—"I am doing as much as I am paid for"—self-respect, inner conflicts and outraged desires as employment problems.

VI. The Effect of the Group in Industry—an interesting discussion of whom to advance or transfer, industrial strife and fears, and the problem of discipline.

VII. The Integration of Conflict and Methods of Analysis.

There is an Appendix on suggestions for studying and teaching practical psychology in which the author advocates the problem method rather than lectures, assigned readings, and tests. Also, an Appendix on "Good Books on Psychology" with a brief characterization of each.

To one interested in employment and personnel problems this book is highly instructive, easy reading, and filled with many practical features gained from experience. It is indeed an industrial

psychology developed out of successful management. EMERY R. HAYHURST

*Hitch-Hikers—By W. W. Peter, M.D., Dr.P.H., and Grace T. Hallock. New York: Cleanliness Institute, 1930. 56 pp. Price, \$.20.*

This is a small, elementary textbook on the communicable diseases entering the body via the mouth and nose. The idea of the germs of disease being passengers, on most of the objects in use in daily life, is maintained throughout, thus justifying the title.

Careful details are given of the possibilities of contagion through air, solid food, water, milk and incidental routes, each subject being treated in a separate chapter with a convenient summary at the end. Emphasis is constantly laid upon methods of disease prevention.

The booklet is well printed and profusely illustrated with photographs and diagrams, and should be a welcome aid to those who are concerned with the teaching or study of the elements of public health. JOHN HALL

## BOOKS RECEIVED

PRINCIPLES OF HYGIENE. By Thomas A. Storey. Stanford University: Stanford University Press, 1930. 475 pp. Price, \$3.50.

THE MORPHINE HABIT. By G. Laughton Scott. New York: Wood, 1930. 94 pp. Price, \$2.25.

PROCEEDINGS OF THE TWELFTH TEXAS WATER WORKS SHORT SCHOOL. Abilene, Texas, January 27-30, 1930. 189 pp. Price, \$1.00.

THE PRINCIPLES AND PRACTICE OF HYGIENE. By Dean Franklin Smiley, Adrian Gordon Gould and Elizabeth Melby. New York: Macmillan, 1930. 415 pp. Price, \$2.50.

HERONYMUS FRACASTORIUS. CONTAGION, CONTAGIOUS DISEASES AND THEIR TREATMENT. By Wilmer Cave Wright. New York: Putnam, 1930. 356 pp. Price, \$4.50.

ADOLESCENCE. STUDIES IN MENTAL HYGIENE. By Frankwood E. Williams. New York: Farrar & Rinehart, 1930. 279 pp. Price, \$2.50.

TROPICAL MEDICINE. Alfred C. Reed. Philadelphia: Lippincott, 1930. 410 pp. Price, \$6.00.

BIOGRAPHICAL SKETCHES AND LETTERS OF T. MITCHELL PRUDDEN, M.D. 1849-1924. New Haven: Yale University Press, 1927. 311 pp. Price, \$2.00.

PROBLEMS AND METHODS OF RESEARCH IN PROTOZOOLOGY. Edited by Robert Hegner and Justine Andrews. New York: Macmillan, 1930. 532 pp. Price, \$5.00.

PIONEERS OF PUBLIC HEALTH. By M. E. M. Walker. Edinburgh: Oliver & Boyd, 1930. 270 pp. Price, \$5.00.

SEVENTY BIRTH CONTROL CLINICS. By Caroline Hadley Robinson. Baltimore: Williams & Wilkins, 1930. 351 pp. Price, \$4.00.

THE CHILD FROM ONE TO SIX. By Ada Hart Arlitt. New York: McGraw-Hill, 1930. 188 pp. Price, \$2.00.



# A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON. PH. D.

**Professional Training of Sanitarians**—A symposium setting forth the British view of adequate hygienic training for medical students, graduates in public health, sanitary inspectors, health visitors. All of interest to American educators.

BUCHAN, G. F., *et al.* The Education of Health Personnel. *J. Roy. San. Inst.*, 51, 2: 73 (Aug.), 1930.

**Industrial Nutrition Work**—How undernourished employees in one industry are induced to undergo an adequate diet is interestingly told.

COMSTOCK, L. Selling Proper Nutrition to Industrial Workers. *P. Health Nurse*, 22, 8: 406 (Aug.), 1930.

**Toxoid or T-A Mixture?**—The findings of the National Institute of Health are noteworthy. “(1) In 475 school children diphtheria toxoid gave an immunity response, as measured by the Schick test, of 95 per cent as compared with 64 per cent in 355 children receiving 0.1 L + dose toxin-antitoxin mixture. (2) No local or general reactions were reported in children receiving toxoid; those giving reactions to intracutaneous test injections of diluted toxoid having been removed from the group. (3) Two doses of 1.0 c.c. each, with an interval of 1 month, produced a negative Schick reaction in a high percentage of subjects.”

HARRISON, W. T. The Immunizing Value of Diphtheria Toxin-Antitoxin Mixture and Diphtheria Toxoid. *Pub. Health Rep.*, 45, 33: 1883 (Aug. 15), 1930.

**Rickets Prophylaxis**—This report illustrates the problems involved in determining the prophylactic dose of viosterol. Larger doses than those for-

merly recommended seem to be in order. No important differences between viosterol and cod liver oil were noted within the limits of this investigation.

Hess, J. H., *et al.* Viosterol (Irradiated Ergosterol). *J. A. M. A.*, 95, 5: 316 (Aug. 2), 1930.

**Ergosterol and Cod Liver Oil**—The antirachitic potency of the irradiated ergosterols tested varied greatly, and the best had less than 60 times the antirachitic activity of the best cod liver oil.

HOLMES, A. R., and PIGOTT, M. G. The Relative Antirachitic Activity of Cod Liver Oil and Irradiated Ergosterol (Viosterol). *New Eng. J. Med.*, 203, 5: 220 (July 31), 1930.

**Childhood Nutrition**—“There appears no reason to conclude that a scientifically balanced milk diet, including 1½ pints to 1 quart of milk a day per child, produces greater growth or better health in growing children from 7 to 15 years than a scientifically chosen vegetable diet furnishing a smaller amount of calcium.”

LANE, D. E., and BOSSHARDT, F. H. Nutrition of Children on a Mixed and on a Vegetable Diet. *Am. J. Dis. Child.*, 40, 2: 285 (Aug.), 1930.

**Milk-Borne Sore Throat**—Another epidemic laid to raw milk, this one an explosive outbreak numbering 187 cases, was caused by dairy workers who apparently infected the milk directly.

LANE, E. A., and ANDERSON, G. W. An Outbreak of Milk-Borne Sore Throat. *New Eng. J. Med.*, 203, 7: 324 (Aug. 14), 1930.

**Antirabic Treatment Paralysis**—A straightforward account of the risk of paralysis during the course of the

Pasteur treatment with which every health officer should be familiar.

McCoy, G. W. Antirabic Vaccine Paralysis. *Pub. Health Rep.*, 43, 33: 1888 (Aug. 15), 1930.

**State Health Administration—**  
This report of a health survey of Iowa is in reality a valuable discussion of health organizations for rural states.

McLAUGHLIN, A. J. A Public Health Survey of Iowa. *Pub. Health Rep.*, 45: 28 (July 11), 1930.

**Cross Connections Cautiously—**  
A clear, concise statement of the reasons for, and the dangers of, cross connections and how the danger may be eliminated.

Mowry, C. W. A Practicable Program for the Elimination and Control of Cross Connections. *J. Am. Water Works Assn.*, 22, 8: 1061 (Aug.), 1930.

**Preventing Childhood Tuberculosis—**Canadian experience in the French scheme of placing children from tuberculous homes, but not yet suffering from the disease, in country foster homes is reported as most successful.

Nadeau, E. The Grancher System, as Applied in the Province of Quebec, for the Protection of Childhood against Tuberculosis. *Canad. Pub. Health J.*, 21, 8: 382 (Aug.), 1930.

**Experimental Water Treatment—**  
The city of Ottawa built a trial water treatment plant to determine the conditions and problems involved before the needed municipal filtration system was installed. Such municipal foresight seems unaccountable. The record of the research is most interesting.

Nasmith, G. G. The Trial Filtration Plant, Ottawa, Canada. *J. Am. Water Works Assn.*, 22, 8: 1017 (Aug.), 1930.

**The Health of the Worker—**  
Despite improved sanitary conditions and public health service, British industrial experience indicates an increas-

ing duration of illness and recovery from accidents. The reasons for these phenomena are discussed.

Oliver, G. The Health of the Worker Today. *J. State Med.*, 38, 8: 454 (Aug.), 1930.

**Symposium on Arthritis—**The present status of the problem, diagnosis, vaccine treatment, other biologic products, bacteriologic studies, nutritional factors, and British administrative projects are all included in this fine series of papers which seem to be the last word on this much discussed subject.

Pemberton, R., *et al.* Symposium on Arthritis. *J. Lab. & Clin. Med.*, 15, 11: 1055 (Aug.), 1930.

**Hookworm Eradication Status—**  
The hookworm situation has passed the initial stage of a unique project and has now become a part of the routine of southern clinicians and health officials. Mass treatment without full consent of parents and physicians is highly inadvisable.

Stiles, C. W. Decrease of Hookworm Disease in the United States. *Pub. Health Rep.*, 45, 31: 1763 (Aug. 1), 1930.

**Interstate Carriers' Water Supplies—**What the U. S. Public Health Service is doing to supervise and certify the drinking water used by interstate carriers makes an effective story of real accomplishment.

Tarbett, R. E. Certifying Water Supplies for Interstate Carrier Use. *J. Am. Water Works Assn.*, 22, 8: 1102 (Aug.), 1930.

**Anaphylaxis—**Serum reactions are more common with concentrated serum than when unconcentrated diphtheria antitoxin was used. The author believes that the increased sensitivity is not all due to the prophylactic use of toxin-antitoxin mixture.

Toomey, J. A., and August, M. H. Reactions Following Administration of Diphtheria Antitoxin and Toxin-Antitoxin; Results of Desensitization. *J. Prev. Med.*, 4, 4: 281 (July), 1930.

# HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

**League of Red Cross Societies—**Public attention is being drawn to the problem of blindness. How can human eyesight be saved? It is a matter of common knowledge, but one to which too little thought is given, that there is a belt of countries encircling the world in which the inhabitants are either threatened with blindness or suffering from grave forms of ocular disease; the whole of Northern Africa, including Morocco, Algeria, Tunis and Egypt, the vast expanse of India and the alternately sparsely and densely populated territory of the Chinese Republic are included in this belt. In Western Europe the leading industrial countries, which are now almost immune from certain diseases as a result of the progress made in preventive medicine, have noted a marked increase in the number of accidents resulting in eye injuries. An American ophthalmologist was no doubt thinking of these countries when he declared that "external injury constitutes the most important cause of blindness through the greater part of life."

Among this multitude of unfortunate human beings who have either lost their sight or are threatened with blindness, there are some who could recover their sight if given suitable treatment; there are a far greater number who could be saved from impending blindness. How can this be achieved? This question is answered in the report published by the International Association for the Prevention of Blindness. This document gives figures showing the deplorable amount of blindness in the world and its geographical distribution; in round figures, the blind population of the different countries is given as follows: 500,000 in China, 1,500,000 in India, 76,000 in the United States, 53,000 in Great

Britain, 36,000 in Germany, etc. It has been estimated that 95 per cent of the native population of Egypt suffer from trachoma, while 90 per cent of the school children in Southern Tunis are afflicted with this disease. Up to the present, the vastness of this problem has been a deterrent to initiative. Setting aside these figures, there can be no doubt that the problem of blindness is far from being insoluble; in the majority of cases blindness is caused by avoidable accident or common forms of disease against which we are powerfully protected: smallpox, trachoma, purulent ophthalmia. Too great insistence cannot be laid on the assertion that blindness can be prevented in the great majority of instances.

**Hygienic Institute—**The 15th report of the Hygienic Institute for the period ending December 31, 1929, is well illustrated and contains much valuable material from an administrative standpoint. It may be recalled that this health organization serves La Salle, Peru and Oglesby. The Tri-City Tuberculosis Society coöperates with the health department in the prevention of tuberculosis and has placed a scale in each of the 23 schools of the communities served, in addition to other provisions.

One nurse is maintained by that organization to work under the direction of the supervisor of nurses at the Institute. The Boards of Education maintain a school nursing program by contributing funds toward the salaries of the school nurses, and the cities also make substantial appropriations for the conduct of the work, in addition to the funds derived from endowment. The Metropolitan Life Insurance Company

has arranged to furnish nursing service to its policyholders through the Institute, which will receive 75 cents per visit.

The year 1929 showed some of the most satisfactory death rates ever recorded; the general death rate being 9.2, corrected for residence 8.3, while infant mortality fell to a rate of 56.3. An interesting table on office and administration activities shows in detail these time-consuming activities which frequently are not recorded by health administrators. Among other items, it is noted that there were 1,102 visitors to the Institute during the year, and 3,336 telephone calls were received, in addition to some 2,000 such calls made.

School physical examinations were made of 2,095 pupils of the 1st, 3d and 5th grades, 1,975 pupils having been found with defects and 2,735 corrections having been made. The report cites the development of certain new educational projects which are worthy of note, including Health Button Contests among school children, and open-window room methods. Disbursements totalled \$38,863 in this district of 30,000 people. The health officer states that while this budget compares favorably with most communities, it is yet not sufficient to meet the full demands of modern public health requirements.

**Johannesburg**—Johannesburg, with an estimated population for 1929 of 350,500, records a white birth rate of 25.9. The native and colored births registered numbered 1,920, but as the ratio of females to males in these population groups is only 1 to 7, the report points out that it would be misleading to suggest a birth rate. The death rate for all persons from all causes for the past year was 14.9, the rate for white persons being 11.1. Marked improvements are noted in infant mortality rates, due unquestionably to the extension of maternal and infant welfare ac-

tivities and the provision of adequate prenatal facilities in the form of nurses and clinics. The report contains many valuable statistical tables and interesting graphs, accompanied by appropriate descriptive text.

**Athens, and Clark County, Georgia**—The annual report for the period ending June 2, 1930, is written in an unusually interesting style, and if the size of type were somewhat larger, this report would doubtless be read by a large audience.

During 1929, the negro death rate in the county exceeded the birth rate in the ratio of 182 to 174. Figures are presented to show that among white babies it may be expected that 43 out of 1,000 will not reach their first birthday, as contrasted with 119 for the colored. Considerable progress is noted in the improvement of milk supplies.

**New Britain, Conn.**—The 1929 report is well printed in type adapted to the soft dull coated paper, easily read. A birth rate of 17.7, a general death rate of 8.3, and an infant mortality rate of 55.7 are recorded. A venereal disease clinic was opened during the year.

An expenditure of 82 cents per capita is noted, but garbage collection accounts for 37 cents of this amount. In this city with a population of 74,240, there were 2,479 laboratory examinations made and 1,127 packages of biologics distributed last year. Wassermann tests are made in the state laboratory. The report concludes with pertinent recommendations by the health officer for future developments, including an isolation hospital, a diphtheria prevention program, a scoring system for dairies, and separation of garbage collection costs from the health budget.

**Elizabeth, N. J.**—On the basis of a 1929 population of 117,633, a death rate of 9.8 and a birth rate of 17.0 are re-

corded. Infant mortality has dropped from a rate of 165 in 1911 to 64.7 in 1929.

Prenatal cases are visited monthly by the child hygiene nurses when an early engagement of an attendant is urged, together with frequent visits during pregnancy. After the birth of the child, mother and baby are visited weekly for the first month and special stress is laid on maternal nursing. There are 27 licensed midwives who are visited monthly by the supervisor for inspection purposes. It is reported that members of the Union County Midwives Association coöperate well with the health department.

Parochial school health work is carried by the health department, as are dental clinics for school children. Four venereal disease clinics are maintained where 5,518 treatments were given. Home visits for follow up of V. D. cases numbered 643. Approximately 50,000 quarts of milk are sold daily in the city, of which  $87\frac{1}{2}$  per cent is pasteurized.

**Kent and Queen Anne's Counties, Md.**—The frontispiece of the 1929 report of the Kent and Queen Anne's County Health Department is a plan of the proposed child health center building for Queen Anne's County, to be erected some time during the year. The building will supply offices for the health officer and nurse, as well as special clinic rooms, operating room, and wards. A new health center is also being erected in Chestertown, Kent County, which

will house the health officer and nurse and will contain rooms for the various clinics and will be equipped with modern and up-to-date appliances. One feature will be a complete dental equipment. The full-time staff consists of a Deputy State Health Officer, 2 white (1 in each county) and 1 colored nurse, and secretary.

The activities of the Deputy State Health Officer, the colored nurse and the secretary are financed by the State Department of Health. The work of the white nurses is financed by the County Commissioners, the County Public Health Association, and the Maryland Tuberculosis Association. Each county has a part-time county health officer, who is a practising physician, and several part-time clinicians.

Maternal and infant death rates being high, close supervision of midwives is maintained. Each midwife is supplied with a complete obstetrical outfit which is inspected regularly by the county nurse. Classes for midwives are held each year. The school health program in the two counties is based on close coöperation between the Deputy State Health Officers and the Superintendent of Education, and calls for a physical examination of every white and colored child in Kent and Queen Anne's Counties. A chest clinic, a child health conference, and an eye, ear, nose and throat clinic are held monthly in each county. Annual mental and orthopedic clinics are also held in each county.

## NEWS FROM THE FIELD

### NEW YORK STATE SEWAGE WORKS ASSOCIATION

THE fall meeting of the New York State Sewage Works Association was held at the Onondaga Hotel, Syracuse, N. Y., September 13, 1930.

C. A. Holmquist, President, presided and paid tribute to the memory of Kenneth Allen, founder and first president of the Association.

Following a brief business meeting, two papers were presented, one on "Chlorine Uses at Sewage Plants" by L. H. Enslow of the Chlorine Institute, and the other on "Stream Pollution from the Operator's Standpoint" by Professor E. B. Phelps of Columbia University.

### TEXAS PUBLIC HEALTH ASSOCIATION

THE Texas Association of Sanitarians, at its eighth annual short school, August 26-28, changed its name to the Texas Public Health Association. Dr. H. K. Read, supervisor of hygienics in the public schools of Houston, was reelected president. Other officers chosen were: vice presidents Jack Wyatt, Amarillo, Dr. T. A. Ward, Beaumont, W. N. Dashiell, Fort Worth, and Celia Moore, Austin; and E. G. Eggert, sanitary engineer for the state department of health, was reappointed secretary.

J. C. Anderson, M.D., state health officer of Texas, was honored by the Association as "a man who has accomplished more for the health of Texas in his unselfish way than, perhaps, any other man." Dr. Anderson was presented with a billfold as a token of appreciation of his services and accomplishments, which were outlined briefly in a presentation speech by Dr. Read.

Houston was selected for the 1931 meeting city. Dallas, Austin, Waco, and other cities had extended invitations to the short school. Among the resolutions adopted was one placing the association in favor of simplification of all plumbing codes.

The organization also went on record for encouragement of proper methods in collecting and disposing of garbage and recommended a permanent program of rat-proofing by incorporating a section of this phase of public health in all building codes.

By resolution the sanitarians endorsed and pledged support to the standard milk ordinance program.

### MICHIGAN CONFERENCE

ON September 11 and 12 the Upper Peninsula Conference on Public Health and Tuberculosis was held in Marquette under the auspices of the Michigan Public Health Association and the Michigan Tuberculosis Association.

### THE BURKE FOUNDATION

A BUILDING for recreational therapy and remedial social activities will shortly be opened in connection with the Convalescent Institute of the Burke Foundation at White Plains, N. Y. This will release more bed space for women patients.

### CHILD STUDY ASSOCIATION

A THREE-DAY conference with Round Table Discussions will be held October 20-22 at the Hotel Pennsylvania, New York, N. Y., under the auspices of the Child Study Association of America.

The Conference will be opened with

a dinner, October 20, the subject of which will be "The Family and Fulfillment of Personality." Dr. Frankwood E. Williams will be Chairman. Speakers will be Dr. Hornell Hart, Dr. Beatrice Hinkle, Dr. H. E. Barnard, and Dr. Eduard C. Lindeman.

#### BI-CO-LI

THE Order of the Bi-Co-Li will meet at the Texas Hotel, Fort Worth, Tex., during the A. P. H. A. Convention.

#### MENTAL HYGIENE INSTITUTE

THE Philadelphia Hospital, Philadelphia, Pa., announces the opening of its Institute for Mental Hygiene. The Institute is planned for patients who will meet the physicians more than half-way in recognizing that they need help—for fatigue, worries, fears, maladjustments, difficulties in getting on with other people or at their work. The services are for both out-patients and resident patients.

The Institute will try to furnish an actual cost-of-care service designed to give people of moderate means every essential of good treatment including privacy and choice of physician, but with no element of charity.

#### ROCKY MOUNTAIN SPOTTED FEVER

DR. R. R. Spencer, U. S. Public Health Service, was awarded the Gold Medal by the American Medical Association in annual session at Detroit in June, 1930, for original work in the preparation of a vaccine against Rocky Mountain spotted fever.

A 5-year record of practical prevention of Rocky Mountain spotted fever achieved by Dr. Spencer was the basis for the award of the medal.

Until 1924 laboratory workers knew no special prophylactic inoculation, and of 16 exposed 6 contracted the disease and all died. Since 1924 there have been 59 laboratory workers all of whom

have received prophylactic inoculation and among these there have been 7 cases all of whom recovered, except 1 who received only one of the two requisite prophylactic doses.

#### FELLOWSHIP IN CHEMICAL RESEARCH

THE Secretary of the Treasury has recently accepted a gift of \$100,000 offered by the Chemical Foundation, Inc., through its president, Francis P. Garvan, under the provisions of the Act of May 26, 1930, which authorizes the government to accept donations and to create a system of fellowships, etc., in the National Institute of Health. The condition is made that the income from this fund be used for one or more fellowships in basic chemical research in matters pertaining to public health, the details of which are left to the Surgeon General and his Advisory Committee.

#### FLIGHT DOCTORS' COURSE

A POSTGRADUATE class in aviation medicine and surgery, believed to be the first of its kind, will be offered next fall by the University of California. The new course is to deal with all phases of a flight surgeon's work.

Colonel Edward L. Munson, 9th Army Corps surgeon, and Colonel W. A. Powell, professor of medico-military science, will direct the course for the university's medical school.

#### AMERICAN EDITORS' AND AUTHORS' ASSOCIATION

THE American Editors' and Authors' Association, in convention at Detroit, Mich., June 24, 1930, adopted a resolution recommending the creation of a Portfolio of Public Health in the Cabinet, and that a copy of the resolution be forwarded to the Secretary of State, Washington, D. C., to the secretaries of all national and state medical organizations, and to all members of the said association.

#### SMALLPOX PRACTICALLY EXTINCT IN BULGARIA AND HUNGARY

**S**SMALLPOX in Bulgaria and Hungary where vaccination is compulsory is apparently almost extinct. Its rarity is evident from the fact that Dr. A. Petrillo, of the State Hygienic Institute of Budapest, and Dr. Ilia G. Minoff, a public health official of Bulgaria, who were visiting health organizations in New York State, said that they had never had an opportunity of seeing a case of smallpox in their native countries.

Dr. Petrillo asked if there had been any recent cases in the state. He was informed at the time that reports of smallpox were being received from a community in the southern section and that if he left immediately he would be able to see patients in various clinical stages. In the course of a week he visited, with the district state health officer, a large percentage of the 39 cases which occurred in one community during this outbreak. None of these cases had ever been vaccinated.

#### GEORGE ROBERT WHITE FUND

**T**HE Sixth Health Unit, established from the income of the George Robert White Fund, was dedicated and presented to the City of Boston on September 15.

### PERSONALS

**DR. J. T. AINSLIE WALKER**, of London, died suddenly on July 27. Dr. Walker is best known in this country for his pioneer work in the standardization of disinfectants. In collaboration with Dr. Samuel Rideal, he gave us the first really satisfactory method for determining the comparative value of disinfectants, their

method being known as the Rideal-Walker Test. After the recent war, Dr. Walker formed the Ainslie Walker Laboratories, Ltd., for the purpose of carrying on research and chemical manufacturing, principally in the disinfectant field. In England he was considered an outstanding authority on disinfectants.

**DR. W. CARSON RYAN, JR.**, Professor of Education at Swarthmore College, has been appointed Director of Education in the Indian Service, Department of the Interior.

**MRS. A. F. FANGER**, of Hialeah, Fla., was elected Historian of the National Congress of Parents and Teachers.

**KENNETH ALLEN**, Fellow A. P. H. A., sanitary engineer for the Board of Estimate and Apportionment of New York City since 1916 and who was to have been retired because of ill health, died September 9, in his home at White Plains. He was born in New Bedford, Mass., seventy-three years ago and was graduated from Rensselaer Polytechnic Institute in 1879.

**KATHERINE Z. W. WHIPPLE** has become secretary of the health education service of the New York Tuberculosis and Health Association, succeeding Iago Galdston, M.D., who is now director of the medical information bureau of the New York Academy of Medicine.

**CHARLES O'HAGAN LAUGHING**, M.D., Member of the A. P. H. A., State Health Officer of North Carolina, died August 26. **H. A. T.**, M.D., was named Acting State Health Officer until a successor is appointed. **DR. JOEL A. SPERRY**, formerly of New Haven, Conn., is now Professor of Bacteriology at Pennsylvania State College, State College, Pa.



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### The Incidence of "Jake" Paralysis in Oklahoma\*

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AND H. A. SHOEMAKER

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ON February 28, Dr. Earl T. McBride of the McBride Reconstruction Hospital, Oklahoma City, called to ask if we would check his laboratory in the examination of the spinal fluid from two patients who had come to his hospital showing a peculiar paralysis. He stated that there was some resemblance to both anterior poliomyelitis and Landry's disease, but that there were additional features in both cases, characteristic of neither. In both the spinal fluids were negative.

About the same time Dr. W. H. Miles, Oklahoma City Health Officer, and Dr. E. Goldfain, an associate of Dr. McBride, investigated 60 cases which came to the attention of the City Health Department. It was found that in every instance the condition affected those going in or frequenting the same section of town; that this section was the location of certain drug stores which were suspected of violating prohibition laws; and it was significant that a number of their employees, and one or two proprietors were afflicted. Careful investigation revealed that the only etiological factor common to all of these cases was a history of habitual indulgence in "Jake."

To Drs. Miles and Goldfain credit should be given for the first indictment against fluid extract of ginger as the causative agent. A number of the druggists selling this product had been visited by federal agents and samples of the fluid extract picked up for analysis. Ordi-

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\* Read before the Epidemiology Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 29, 1930.

nary methods showed them to be standard in every respect, but more careful analysis revealed them to be low in ginger extractives. After the appearance of these cases samples were again obtained and analyzed for heavy metals. It was at first announced that the paralysis was due to lead poisoning. The mistake made was in the finding of a so-called "passive" sulphate of iron which precipitated out after sulphuric acid digestion and returned to solution quite slowly.

The authors felt quite certain that the clinical symptoms were not due to lead, and I believe the case histories given here will bear us out. Preliminary chemical work was started, details of which will be given later.

In the meantime numerous facts of interest began to come to light. Cases were reported from other sections of the state. On April 1 cards were sent to about 2,500 physicians in the 77 counties of the state. On April 23 approximately 40 per cent of these had been returned and showed 536 cases in 39 counties. Because of the tendency to be ashamed of the affliction it is safe to assume that this number represents only about one-third of the cases and that there are therefore between 1,500 and 2,000 in the state. Reports and inquiries began to come in from all sections of the country, notably, Alabama, Mississippi, Georgia, Kentucky, Tennessee, South Carolina, North Carolina, Louisiana and Ohio. Different theories were developed as to the cause, all of which broke down under investigation.

Three instances suffice to show how each additional report strengthened our belief in the fundamental truth of our own theory. From Tulane came the report that a physician who was treating several such cases had become paralyzed himself. He denied ever having used "Jake" and the inference was naturally drawn that we were dealing with some type of low grade infection. The cat escaped from the bag when the patients stated that the doctor had purchased his ginger from the same source as themselves. Again—

The connection of fluid extract of ginger with these cases is being generally definitely established, though there have been some instances where the use of ginger extract has been denied. One such case was the superintendent of a mill in Georgia who was affected with the paralysis, which the doctor diagnosed as the result of ginger drinking, though the patient denied it. The doctor, however, confirmed his diagnosis by means of a ruse, telling the patient's wife that he was writing out a prescription which might be of benefit, but if he had been drinking ginger extract not to give it to him as it might produce fatal results. The patient then announced he would not use the prescription.<sup>1</sup>

Finally, there is the instance of the girl whose mother gave her half

an ounce of fluid extract of ginger to relieve the pains of dysmenorrhea and who later developed the paralysis.

After becoming convinced of the fact that ginger extract was the causative agent we began to cast about for the ingredients at fault. Numerous statements appeared, all of which were considered carefully before being discarded. Among them were the following: that lead or some other of the heavy metals were to blame; that the paralysis was due to water passing through deposits of bauxite; to a fungus growth on the ginger; to another root closely resembling ginger but containing a toxic alkaloid; to use of ginger which had been redistilled, thus rendering the product toxic.

The application of cold reasoning ruled out most of the above, and chemical analysis eliminated the rest. The reasoning followed was based on the fact that the condition made its appearance nearly simultaneously in widely separated parts of the country, that cases originated only during a very brief period of time (no new cases are being reported); that in all the centuries during which ginger in various forms had been used as a condiment, seasoning, flavoring material, confection, or drug, no record of a similar outbreak could be found.

All of the above points led to the assumption that some new adulterant was being used in the preparation. That there was reason for suspecting this is supported by the fact that standard preparations of ginger contain such a quantity of ginger extractives that extreme dilutions are necessary before the fluid becomes potable, and such dilutions reduce the alcoholic content until the desired "kick" cannot be obtained. The first adulterant suspected was iso-propyl alcohol. This was found in varying quantities in several samples, but the findings of others<sup>2</sup> convinced us that this was in no way concerned unless there was a chemical combination with some of the ginger extractives. Animals were therefore fed fluid extracts made of African and Jamaica ginger, using as a menstruum ethyl alcohol denatured with 1 per cent iso-propyl. Dogs fed 1 oz. of the above preparations showed no symptoms after from 6 to 10 weeks.

During the course of these experiments, the first autopsies on cases of ginger paralysis were held.

*Case I.* Male, white, age 68, laborer. Had been heavy consumer of alcohol all his life. No history of venereal disease. No Wassermann. Developed a well marked case of "Jake" paralysis, following debauch. Came into hospital with cough and lung symptoms premonitory of pneumonia, and general malaise. Râles in bases of both lungs. Blood pressure not obtainable because of arteriosclerosis. On the third day he developed stertorous breathing and other symptoms of brain pathology. He died about 48 hours later.

Autopsy showed generalized arteriosclerosis. Some pulmonitis but no definite

pneumonia. Liver somewhat retracted, slightly nodular, darkly mottled. Kidneys not remarkable. Brain described as water-logged. Spinal cord and sciatic nerve, no gross pathology. Cause of death, cerebral edema.

Microscopic sections of the organs showed nothing remarkable. First examination of the material from the nervous system was made by Dr. H. G. Jeter, who reported cellular exudate in some of the fibers of the cauda equina as the only lesion found, and on this basis made a diagnosis of perineuritis. Sections were run by the routine histological methods.

In this laboratory the material was run through special neurological methods using sudan IV-hematoxylin, toluidin blue, and osmic acid stains.

*Sudan IV-Hematoxylin.* Lower lumbar cord. (1) Brownish red granules packed in marginal area in all nerve cells of the anterior horns. Similar brownish granules in some cells of dorsal horns. (2) Karyolysis, either breaking up of nucleolus—condensation of karyosomes, or complete lysis of karyotin material with disappearance of nucleolus. (3) Migration of the nucleus in many cells. Edema and lymphocytic exudate around the neural canal, desquamation of neural canal epithelium.

*Toluidin blue* stain shows presence of tigroid bodies—but with frayed margins—in all cells containing a nucleus in good condition, except in regions of the cell occupied by granular material described above. This type of pathological condition of nerve cells was also found in the upper thoracic, lower cervical cord, medulla including the inferior olive, nuclei of the floor of the fourth ventricle at this level, and the dentate nucleus.

*Osmic acid-Mueller* stain of material from the same regions revealed black granules in all places where Sudan IV had shown brownish red granules.

*Marchi* stain of the sciatic nerve showed (a) in cross sections some fibers in every fascicle which stained black; (b) in longitudinal section, some fibers were all black, others showed black masses at the nodes of Ranvier, or scattered along in the internodal spaces.

The exudation around the neural canal was found at all levels of the cord examined, but not in the region of the fourth ventricle.

*Case II.* Male, white, age about 70. Always used alcohol. No history of venereal disease. No Wassermann. "Jake" paralysis, or locomotor ataxia. Came into hospital in semi-comatose condition. Died after short stay. Diagnosed possible uremia.

Autopsy revealed aneurism of ascending aorta, atheromatous aorta, and arteriosclerosis. Other organs not remarkable. Complete central nervous system removed together with sciatic, anterior tibial, part of brachial plexus, and radial nerves. No gross pathology evident except probable swelling of anterior tibial nerve. The special staining methods used in Case I showed identical pathology of nerve cells and fibers with that case.

It occurred to us that if the pathology is due to "Jake," and it has, as in Case I, reached the vital centers, the symptoms and death could be due to the changes described above. The symptoms would be those involving the failure of the vital centers, and death from "Jake" is possible.

Since the microscopic findings in the above cases seemed to us to

be unique, and—with only 2 cases autopsied—characteristic, we set about to determine, if possible, the causative agent. On April 25 one of the authors (D. T. B.) visited L. T. Hoyt, Chemist in Charge Federal Prohibition Laboratory at New Orleans, La., where he learned that some samples seized had shown the presence of a phenol compound which had not been positively identified but was thought to be tricresyl-phosphate. Analysis up to this time, by the methods of Fuller and Authenreith & Warren, had failed to disclose anything unusual. This may have been due to the fact that the samples analyzed by us had actually not contained the adulterant. Taking advantage of the findings of Mr. Hoyt, an attempt was made to isolate and identify the phenolic substance suspected. No tests could be found in the literature available, and after some experimentation the following procedure, modified from Fuller, was adopted:

Sixty c.c. of the fluid extract of ginger was placed in a small distilling flask, connected with a condenser and placed in a water bath. The alcohol was distilled and collected for examination. The residue was diluted with water, transferred to a separatory funnel and extracted with ether. The ether solution was then extracted with a 5 per cent alkali solution, washed with distilled water, extracted with dilute sulphuric acid, again thoroughly washed with distilled water, filtered, and the ether evaporated on the water bath.

After the beaker and contents had cooled, the residue from the ether solution was thoroughly extracted with petroleum ether. Upon evaporation of the petroleum ether, a rather viscid, slightly yellow residue was obtained. The distillate from this residue when warmed with alkali and distilled after acidification with sulphuric acid gave strong positive tests with Millon's reagent, bromine water, and the formaldehyde and sulphuric acid reagent. The precipitate was amorphous with the bromine water and did not give the pink color that is obtained with phenol. In other words, the indications are that it was a cresol rather than a phenol.

The residue in the flask still contained a large amount of undissolved material which was washed with concentrated sulphuric and nitric acids until a colorless solution was obtained and tested for phosphate with ammonium molybdate. A very positive test was obtained. From the manner of the extraction and the tests, it was assumed that the substance was tricresyl-phosphate. Quantitative analysis showed the substance to be present in a strength of about 3 per cent.

Having convinced ourselves of the identity of the adulterant chemically, experiments were made to substantiate our belief by pharmacological and pathological methods. Ten chickens and four dogs have been used.

Technical tricresyl-phosphate was secured and administered to young, full grown chickens and dogs. The dosage for chickens was 5 c.c. administered orally with a catheter. In about a week there were symptoms of unsteadiness in the use of the legs of the chickens, which became more pronounced in 24 hours; at this time another dose

was given. The 9th day from the initial dose, foot drop and difficulty in using legs were very marked in all chickens; 2 days later cyanosis of the comb and respiratory embarrassment were present, and about the 11th day, the chickens died. Since the behavior of the chickens and the symptoms which developed were identical with those which had received dosages of Jamaica ginger that had produced paralysis in human beings (see Figures I and II), we felt assured that the deleterious substance that had caused the epidemic of paralysis in humans was tricresyl-phosphate.

FIGURE I



Chicken 1. 5 c.c. Tricresyl-phosphate, 6/5/30—Repeated 6/13/30, Photographed 6/16/30—Died 6/16/30, P.M.

FIGURE II



Chicken 2. 15 c.c. Deco Ginger, 6/5/30; 10 c.c. Deco Ginger, 6/13/30, Photographed 6/16/30, Killed for Pathological Study 6/21/30.

Misfortune overtook the dogs before we had finished our studies. One was taken by some students by mistake and used in an experiment in another department. A second, which at the end of the 8th week had developed marked loss of use of hind legs and feet, also respiratory embarrassment including almost complete loss of voice, was likewise destroyed prematurely. The third escaped just after it had begun to show symptoms; and the fourth, though showing early signs of poisoning, has not advanced sufficiently at this time to warrant pathological examination. However, our experiments showed that while paralysis of dogs by the use of Jamaica ginger containing small percentages of tricresyl-phosphate was attained with great difficulty; nevertheless, they could be paralyzed by the drug alone, although the onset is slow. The dosage was 10 c.c., administered by mouth at 3-day intervals. Two doses were given to each animal.

Further to prove the question in point, it seemed advisable to try the effect of Jamaica ginger containing tricresyl-phosphate. For this purpose a sample of Jamaica ginger was secured which contained no cresyl or phosphate and was known to be of U. S. P. Standard. Four groups of two each of chickens were used. To one Jamaica ginger not containing tricresyl-phosphate was given; to the other three Jamaica

ginger containing various percentages of tricresyl-phosphate. The results are shown in Table I.

# DISCUSSION OF TABLE

The results of these experiments are interesting for a number of reasons. The experiments showed: (1) Jamaica ginger not containing tricresyl-phosphate produced no paralysis or paralytic symptoms, and aside from the initial intoxication following the administration had no effect on the well-being of chickens; (2) Jamaica ginger containing as little as 1.5 per cent of tricresyl-phosphate would cause paralysis and even death of chickens; (3) in proportions greater than 3 per cent, death would occur in a few days—in our experiments, 14 days.

Another interesting point was the difference in the resistance of the different chickens to the ultimate effect so far as time was concerned. It will be noticed that chicken No. 6 received 1.5 per cent of tricresyl-phosphate and died in about 19 days, while chicken No. 8, which was

TABLE I

Chicken No.	6/2/30	6/24/30	6/30/30	7/3/30	7/9/30	7/10/30	7/12/30	7/14/30	Ultimate Fate
3	Gin. 1	Gin. 1	Well	Well	Well	Well	Well	Well	Dead 7/20*
4	Gin. 1	Gin. 1	Well	Well	Well	Well	Well	Well	Killed 8/15†
5	Gin. 2	Gin. 2	Leg weakness	Leg & foot weakness marked	Paralysis severe	Feet weakness	Feet useless, swelling of eyes	Condition same, respiratory trouble	Killed 8/15†
6	Gin. 2	Gin. 2	Leg weakness	Leg & foot weakness marked	Paralysis, respiratory trouble	Dead			
7	Gin. 3	Gin. 3	Leg weakness	Leg & foot weakness marked	Paralysis, respiratory trouble	Condition worse	Dead		
8	Gin. 3	Gin. 3	Leg weakness	Leg & foot weakness marked	Paralysis, respiratory trouble	Feet useless, respiratory trouble same	Condition same	Condition same	Dead 8/14
	6/21/30	6/24/30	6/27/30	6/30/30	7/5/30				
9	Gin. 4	Gin. 4	Leg weakness	Paralysis marked	Dead				
10	Gin. 4	Gin. 4	Leg weakness	Paralysis marked	Dead				

Different samples of ginger are marked: 1, no tricresyl-phosphate; 2, 1.5 per cent of tricresyl-phosphate; 3, about 3 per cent; and 4, about 4 per cent tricresyl-phosphate. The doses were 5 c.c. of each mixture with 15 c.c. of water administered by mouth.

\* The cause of death of chicken No. 3 on July 20 was not determined. It was apparently all right at 5 P.M., July 19. It had not at any time shown any effect of the ginger, and at autopsy none of the pathology found in those showing the effects of ginger.

† Chickens Nos. 4 and 5—One well and one paralyzed. Since they had shown no change for over 3 weeks, it was decided that it was more valuable to make microscopic examinations of them than to keep them living for a longer period.

given 3 per cent, lived 53 days. The time of the appearance of initial symptoms was practically the same for all concentrations used, in this series being about 9 days. Another similarity was that, regardless of the duration of life following the onset of symptoms, all of the chickens developed respiratory difficulties; all died in coma; and all developed edema of the orbital region with watering of the eyes. The paralysis in all cases was very similar to that found in humans in "Jake" paralysis—toe drop, inability to use the feet, and while the legs could be moved they could not be used for ambulation. So far as we were able to discern the chickens' wings were not affected.

We were somewhat disappointed in the microscopic examination of the central nervous system, in that we did not find the fatty degeneration which was present in the human cases. We did, however, find karyolysis, karyorhexis, and degeneration of the nerve cells as shown by the difficulty or inability to stain them by any method. We may say that the typical pathological lesions so far as the central nervous system is concerned in cases of intoxication resulting from tricresyl-phosphate are karyolysis, karyorhexis, and degeneration of the cell bodies, the exact type depending on the animal affected.

A very interesting series of experiments on rabbits, dogs and calves, by Smith,<sup>3</sup> arriving at similar conclusions, differs from our work in that we were able to produce symptoms in dogs and were able to compare human and animal pathology.

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# Sanitary Features of Irrigation\*

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IN the desert more heed is given to water than is necessary in a country with a plentiful rainfall. It is the very basis of existence; with an ample supply the country prospers; without it the land remains barren. To supplement the shortcomings of nature in failing to provide a method to catch and retain the scant rainfall allotted to the Southwest, dams and reservoirs have been constructed to impound the surface runoff of storms so that the water may be conserved for use during dry seasons. The largest of these projects have been for irrigation and have had a direct effect upon the ground water levels of the irrigated valleys, building up a secondary underground storage of water.

The climatic condition normal to the arid Southwest may be somewhat better understood at this time when so much of the country has been suffering from drought. The normal annual precipitation for Arizona is 13.61",<sup>1</sup> varying from 3.10" at Yuma with an elevation of 150 ft. to 32.42" at Crown King with an elevation of 6,000 ft. The low humidity prevailing increases evaporation to such an extent that it is from 4 to 29 times the amount of rainfall. Such a condition makes "dry-farming" an impossibility.

When such a situation exists all water is valuable, regardless of its sanitary quality—the great concern is to utilize every drop. To do this the relatively pure impounded surface runoff is used for irrigation. This water percolates down through the soil, is pumped to the surface, and again irrigates crops. Raw sewage and the effluent from sewage treatment plants are also used for irrigation. The application of water to the land for growing crops is the same in each case; however, when sewage is employed more careful farm management is necessary, and the crops that can be grown are limited by custom and public health regulations.

The main canals of an irrigation system should be considered, for sanitary purposes, as streams with controlled flow. Taking the place

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\* Read before the Public Health Engineering Section of the American Public Health Association, at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 28, 1930.

of small rivers that flow through territory with more abundant rainfall, they are used by camps of agricultural workers for drinking water, washing clothes, swimming, watering live stock, and many other domestic purposes. The water in canals is usually of fairly good quality at the main diversion dam, but as it flows through the miles of cultivated area pollution increases until at the end of the system it has none of the clear, sparkling qualities so desirable in potable supplies. Samples taken at the head of one of the main canals of a large project<sup>2</sup> had a count on agar at 37° C. of 150 bacteria per c.c. and *B. coli* group in one of five 10 c.c. portions. After flowing 16 miles, largely through farm land, there was an average count of 1,800 and 100 *B. coli* per c.c. At this point the entire flow of a river was diverted into the canal. The river water had an average total count of 2,000 per c.c. and 10 *B. coli* per c.c. Some 24 miles farther down the canal the average count was 2,600 and 1,000 *B. coli* per c.c. The dissolved oxygen of the canal water ranged from 6.90 to 11.55 p.p.m. and the 5-day oxygen demand from 0.2 to 6.35 p.p.m.

There was no evidence along the banks of the canal of any quantity of pollution entering the stream. Trash and refuse are sometimes thrown in the canal, the bodies of small animals are occasionally seen floating along, and the water which is clear at the diversion dam becomes muddy and contains floating grass and weeds.

Maintaining a canal system in a sanitary condition throughout its entire length would be a problem of magnitude. The canal mentioned above, one of the four main canals on the project, has a normal flow varying from 40 to 242 sec. ft.; after rains, when no water is needed for irrigation, the bed may be nearly dry. It is approximately 40 miles long, and there are many additional miles of laterals and ditches. Chlorine introduced at the canal heading would be dissipated long before the farm area was reached and would not take care of incidental pollution. Streams receiving sufficient raw or partially treated sewage to deplete the oxygen and materially increase the *B. coli* content should be purified to some extent before being used for general irrigation. It would be much simpler to treat and sterilize the sewage, though it is sometimes a problem to convince town councils of the wisdom of this policy.

It is difficult, if not impossible, to control the sanitation of the camps of unskilled laborers who are brought into an irrigated area. These workers, poor and ignorant, with no background of cleanly traditions, live in shacks under the trees along the canal banks. Their methods of waste disposal are primitive; if not carefully watched they will place privies on the inner bank of the canal, which also serves as

their water supply, bath tub, and laundry. Despite these conditions, remarkably few cases of water-borne diseases have been attributed to the use of canal water. In a few instances people swimming in the canals have contracted typhoid fever. In tracing the source of these infections we have on 2 occasions found a case among the Mexicans in a nearby camp. These patients were sent to a hospital and no further cases occurred in those districts. The flies that breed about these camps we feel are much more of a menace to health.

A few years ago a newspaper syndicated article blamed a typhoid outbreak in Chicago on lettuce grown in the irrigated districts of the Southwest. The health authorities claimed oysters were the causative agent, but unfortunately the accusation of the unscientific writer had much greater circulation than the health report, and it appeared that the lettuce growers would be heavily penalized unless this statement could be proved false.

We examined lettuce from 16 fields in different parts of the Salt River Valley and 2 in the Eloy district and found no evidence of *B. typhosus* or allied organisms. Many heads of lettuce were cultured and, while our technic was hastily devised, we felt if there had been any general contamination some indication of it would have been found.

In the irrigation districts with which I am familiar the *B. coli* in canal water originates from animal or agricultural sources. Human pollution is very slight, unless towns empty sewage into a stream that is later diverted for irrigation; even in this case dilution may furnish a factor of safety. A. L. Dopmeyer, Assistant Sanitary Engineer, U. S. Public Health Service, and the writer made a sanitary survey of an irrigation system alleged to be furnishing grossly polluted water. Our findings did not indicate any contamination sufficient to endanger the health of consumers of vegetables grown on land irrigated from these canals.

Mosquitoes may be a resultant evil of irrigation. In Arizona the topography and nature of the soil have largely prevented conditions favorable for their propagation. The main breeding places are in the weeds and grasses growing along the banks of drainage canals with low velocity or in water that is allowed to overflow the ditches and stand in ponds outside the fields. This latter is somewhat controlled by the Water Users' Associations that impose penalties for wasting water.

Irrigation as a means of land disposal of sewage has a most favorable field of operation in the Southwest. The scant annual rainfall, low relative humidity, and economic value of water present conditions for its success. With few streams having an average flow sufficient to

furnish dilution water, broad irrigation seems the logical method for final disposal of sewage. The management of a disposal farm is similar to that of any other sewage plant, and the results are directly dependent upon the ability of the employees.

There has been a tendency in recent years to disparage this method of disposal, but in the arid sections of the country its value is being more appreciated each year. California and the City of Los Angeles are studying land filtration and the recovery of water. It does seem futile in a country where water is so badly needed to waste the moisture content of sewage by allowing it to flow aimlessly down a dry arroya or into the ocean.

It is doubtful if irrigation with raw sewage will ever be an unqualified success; the nature of the solids and the amount of nondigestible cellulose tend to clog the soil and limit the type of crops that can be grown. Bar screens and preliminary sedimentation are necessary to give a sufficiently clear effluent for use without causing excessive odors or clogging the soil. More complete treatment serves to minimize these difficulties. With proper farm management the effluent from septic tanks can be used on crops without causing complaint.

Phoenix, Ariz., has a contract with a rancher to dispose of the 7,320,000 gal. per day effluent from the septic tanks. These tanks are old and overloaded; the effluent has a high oxygen demand, a pervasive hydrogen sulphide content, and large *B. coli* count; with all these faults it irrigates 300 acres of land on which are raised hay and grain sufficient to feed 1,000 head of stock a year. The rancher claims he can produce better crops and pasture nearly double the amount of stock that is possible on farms irrigated with canal water. The soil conditions are particularly favorable for disposal, being virgin river bottom land with a loose loam surface. At times it takes the entire flow for 26 hours to irrigate 10 acres.

This is the silver lining—the cloud also has a very dark side. The maximum water needed for irrigation is 980,000 gal. per acre per year, or for 300 acres 294 million gal., whereas the city delivers 2½ billion gal. of effluent to the farm. There is a large loss from evaporation, but the sun and climate have not prevented sufficient overflow to ruin the recreational features of the river for some miles below. The city is now having a more complete treatment plant designed so that the excess water can be sold to one of the irrigation districts.

The Tucson disposal farm, owned and operated by the city, has 355 acres under cultivation, with more being prepared for crops. Coarse bar screens and mechanical clarifiers treat the sewage before it is applied to land; the sludge is pumped to a four-compartment di-

gestion tank and when dried is used as fertilizer. The farm is operated by a skilled agriculturist who, by careful management, has been able to use a maximum of  $7\frac{1}{2}$  acre ft. without spoiling the crops by over-irrigation. This excessive quantity will be reduced as more land is cleared and levelled. About 2,400,000 gal. of clarified sewage are delivered to the ditch each day.

The maximum penetration noted after heavy application of sewage was 24 in. The farm lies along the Santa Cruz River; occasionally irrigation water reaches the dry channel through gopher holes or when it overflows from adjacent fields. A cased well 75 ft. deep near the heading of the ditch shows a consistently good quality of water.

The hydrogen sulphide in the effluent as it enters the ditch is from 1.5 to 2.0 p.p.m.; one-quarter of a mile farther on, at the corner of a highway, there is still sufficient gas to cause some complaints from motorists. As the district about the farm builds up it is felt that it will be necessary to give the sewage some further treatment so the effluent will be more stable when delivered.

Crops of corn, barley, milo maize, higuera, and cotton are grown; sheep are used to keep the Johnson grass out of the ditches; and experiments are now being made with hog feeding. The income from the farm pays all of the operating costs of the plant and most of the fixed charges. This year it may show a slight profit. Certainly this is a safer and saner method of disposing of plant effluent than allowing the partially treated liquid to flow down the dry channel of a river, relying on infrequent floods to carry away the deposited solids.

Any project whether irrigated with impounded surface runoff, drainage water pumped onto the land, or clarified sewage, offers many problems in sanitation. Waste disposal and mosquito control are much the same as in any rural districts, and there is the usual question of obtaining a satisfactory water supply for household purposes. When no suitable ground water is available at reasonable depths, the supply must be taken from the canals. Various types of home-made filters and sedimentation in jars are used to clarify the water, but no efficient simple means has been devised to purify it. True, it might be boiled for 20 minutes, but in a country with a mean maximum summer temperature of  $100^{\circ}$  F., cooling boiled water is no easy matter for a farm laborer's wife. The type of worker who lives along the canal banks is bewildered by even simple directions for sterilizing a bucket of water with some chlorine preparation.

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# The Control of Thermophilic Bacteria in Pasteurizing Plants\*

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THE control of thermophilic bacteria in pasteurizing plants is a problem receiving much attention. Lack of information on control under practical operating conditions led to a series of studies by the authors which were carried out in 1928 and 1929 in coöperation with the manufacturers of pasteurizing equipment, the departments of health, and the milk companies concerned.

The five market milk plants studied were large ones with pasteurizing runs of 5 to 7 hours, located at Buffalo and Syracuse, N. Y.; and Pittsburgh, Pa. Two of these used Burrell long flow holders, two Electropure flash, and one Creamery Package coil vat pasteurizers.

The general plan followed was first to take a series of samples at various stages during the pasteurizing run to gain a general idea of the situation. Counts were made by the direct microscopic method, and by the agar plate method, incubating the plates at 37° C. and 62.8° C. Comparison of plate counts at the two temperatures showed that many thermophiles failed to develop at 37° C. The direct microscopic method proved valuable in detecting an increase in thermophiles, as those encountered were large rod shaped spore-forming bacteria of types not commonly found in the raw supply. A few samples were examined with the methylene blue reductase test, using 62.8° C. as the incubation temperature and a layer of paraffin oil as a seal. This proved satisfactory and a microscopic examination of the milk after reduction revealed apparently pure cultures of rod shaped bacteria.

After a general idea of the situation had been obtained, an attempt was made to reduce the number of thermophiles by controlling the factors favoring their development.

Out of the mass of data secured in studies that occupied about five months, the results of certain instructive analyses are given.

\* A preliminary summary of this paper is given in the *J. Bact.*, 19: 46-47, 1930. Other studies in the same series are published as *Bulletins* of the New York Agricultural Experiment Station, and may be secured on application to that Station.

TABLE I

THE RAPID DEVELOPMENT OF THERMOPHILES AT PLANT A, AS SHOWN BY THE INCREASE IN THE DIRECT MICROSCOPIC COUNT IN THE MILK LEAVING THE LONG FLOW HOLDERS—  
CARELESS OPERATING CONDITIONS

Date	Start to First Hour*	First to Second Hour*	Second to Third Hour	Third to Fourth Hour	Fourth to Fifth Hour	Fifth to Sixth Hour
Holder 1						
Aug. 28, 1928	600,000	600,000	1,500,000	3,000,000	7,500,000	————
Aug. 29, 1928	<10,000	<10,000	3,000,000	4,500,000	9,000,000	————
Oct. 7, 1928	————	————	3,000,000	————	21,000,000	36,000,000
Oct. 10, 1928	————	————	————	3,600,000	15,000,000	12,000,000
Oct. 14, 1928	————	————	————	1,500,000	4,500,000	6,000,000
Holder 2						
Aug. 28, 1928	<10,000	1,500,000	300,000	4,500,000	6,000,000	————
Aug. 29, 1928	600,000	1,500,000	6,000,000	7,500,000	————	30,000,000
Oct. 7, 1928	————	————	————	————	9,000,000	17,000,000
Oct. 10, 1928	————	————	————	3,000,000	4,500,000	8,400,000
Oct. 14, 1928	————	————	————	12,000,000	15,000,000	6,000,000

\* The direct microscopic counts of individual bacteria for the first 2 hours cannot be considered accurate, because of the possibility of confusion with rod shaped bacteria of other types. Returned pasteurized milk was sometimes mixed with the raw supply, which explains the variations encountered at the start. Where spaces are blank, no samples were taken.

Examination of the raw supply at the five plants showed few thermophiles, usually less than 500 per c.c. as determined by an agar plate count at 62.8° C. Several exceptions were noted, indicating that unusual conditions may produce a high thermophile count in the raw supply. Return of unsterile moist cans to the producers proved to be one of these conditions. No method of completely eliminating thermophiles from the raw supply was found.

At one of the plants using long flow holders and at that using coil vat pasteurizers, the small number of thermophiles in the raw supply proved sufficient to inoculate the pasteurizing equipment so that, with careless operation, several millions of thermophiles per c.c. ordinarily appeared in the pasteurized milk toward the end of the run. In the two cities concerned, the situation was only partially appreciated by the officials in charge of milk inspection, as the number of colonies developing on standard agar plates from bottled milk picked up at random varied from less than 10,000 per c.c. to less than 100,000 per c.c. Many of the colonies obtained were of the pin-point type and the records of the two companies, as would naturally be expected from the fact that the samples examined were selected at random over a long period, were very irregular and inconsistent.

Table I shows the development of millions of thermophiles per c.c. during a 5- to 6-hour pasteurizing run at Plant A where two Burrell long flow holders were in use. The factors responsible for this rapid

development were found to be (1) presence of thermophiles in the raw supply, (2) prolonged holding of milk at pasteurization temperature, (3) repasteurization, (4) cooking of milk solids on to the walls of heaters, (5) presence of dead ends, and (6) the development of thermophiles within the holder. Each of these factors was studied individually.\*

That faulty plant operations were of greater importance than the type of equipment and presence of thermophiles in the raw supply is shown in Table II, which gives the results of studies made at Plant B. Plant B used a Burrell long flow holder similar to that at Plant A, but none of the faulty operations found in Plant A were practised. This limited the development of thermophiles to two factors: (1) presence of thermophiles in the raw supply, and (2) development within the holder itself. Table II shows that only 60,000 to 600,000 thermophiles developed per c.c. in a 4-hour run, as disclosed by direct microscopic examination, in contrast to several millions per c.c. at Plant A during a run of the same length.

TABLE II

THE COMPARATIVELY SLOW DEVELOPMENT OF THERMOPHILES AT PLANT B, AS SHOWN BY THE DIRECT MICROSCOPIC COUNT ON MILK LEAVING A LONG FLOW HOLDER—  
CAREFUL OPERATING CONDITIONS

Date	Start to First Hour	First to Second Hour	Second to Third Hour	Third to Fourth Hour
Sept. 17, 1928	<10,000	<10,000	60,000	60,000
Sept. 19, 1928	<10,000	<10,000	<10,000	600,000

Repasteurization of milk returned from routes was practised at one plant using Burrell long flow holders and at one using Electropure pasteurizers. This was mixed with the raw supply previous to repasteurization. At the plant using the long flow holders, the discontinuance of repasteurization reduced the number of thermophiles but did not correct the trouble until other faulty operations were corrected.

Conditions were not favorable for the development of thermophiles with the Electropure process, on account of the high temperature employed (73° C.) and the installation and uniform operation of equipment. Table III gives the results of studies at two plants, C and D, using Electropure pasteurizers. These were operated in the same way except that repasteurization was practised at C but not at D. Table III shows that repasteurization was responsible for an increased development of thermophiles at Plant C, although the numbers were

\* A detailed study is given in *Technical Bulletin No. 156* of the New York Agricultural Experiment Station, Geneva, N. Y.



not high as compared with those found in the other plants studied. Where no repasteurization was practised the increase was negligible. The small numbers of bacteria present made a direct microscopic count impossible and necessitated the use of agar plates incubated at 62.8° C.

Prolonged holding at temperatures above 37° C. was a factor in the development of thermophiles. At one of the plants using long flow holders, this was brought about by stopping the milk pump to wait for milk at the receiving platform, and by having a greater pasteurizing than bottling capacity which caused shut-downs. At the plant using the coil vats, there was poor management and some of the batches were held from 1½ to 2 hours at the pasteurizing temperature. Table IV shows that samples of this milk, taken from the same vat at intervals, gave a decreasing 37° C. plate count due to the destruction of the less heat resistant bacteria, and an increasing direct microscopic count due to the development of thermophiles. It shows in a striking way that special methods are necessary for the detection of thermophiles, as the 37° C. plate count alone would not have revealed their presence.

The rôle that filter cloths played in the development of thermophiles depended entirely on the temperature at which the milk was filtered and the length of time that the filters were in operation. Contamination from filter cloths was an important factor at the plant using the coil vats. This plant filtered the hot milk following pasteurization, the same filter cloth being used throughout the run of approximately 5 hours. Three or four stops of 10 to 20 minutes were ordi-

TABLE III

A STUDY OF THE DEVELOPMENT OF THERMOPHILES IN THE ELECTROPURE PASTEURIZER—SAMPLES TAKEN SIX TO SEVEN HOURS AFTER THE START OF THE PASTEURIZING RUN

Date	36 Hour Agar Plate Counts at 62.8° C.	
	Raw Milk	Pasteurized Milk
	Plant C, Repasteurization practised	
June 14, 1929	520	33,000
June 17, 1929	4,500	42,000
June 18, 1929	780	2,400
July 3, 1929	0	3,200
July 9, 1929	240	<100
	Plant D, No Repasteurization practised	
June 19, 1929	0	<100
June 21, 1929	1	140
June 27, 1929	30	70
July 8, 1929	1,500*	7,900

\* The count of 1,500 on July 8, 1929, is higher than is normally found in raw milk. No explanation is available. The pasteurized milk shows a higher count on the same date than usual.

TABLE IV

DECREASE IN THE 37° C. PLATE COUNT AND INCREASE IN NUMBER OF THERMOPHILES  
IN THE SAME VAT OF MILK AS A RESULT OF PROLONGED HOLDING AT  
PASTEURIZATION TEMPERATURE

Date	Holding Time	37° C. Plate Count	Direct Count of Thermophiles
Aug. 19, 1929	20 minutes	70,000	30,000
	60 "	16,000	75,000
	90 "	7,000	900,000
	110 "	5,000	1,800,000

narily made, due principally to a greater pasteurizing than bottling capacity, but could have been reduced by better management. The filter was connected in such a way that it remained filled with hot milk during any period in which the machinery was stopped. Table V shows that these stops were instrumental in building up a thermophilic flora in the filter cloth so that contamination persisted after the milk that was allowed to stand in the filter during the idle period had been pumped out.

The findings were also confirmed by direct microscopic examination of milk and sediment scraped from the filter cloth at the end of the run, which showed enormous numbers of thermophilic bacteria. The increase was evidently due to development of thermophiles in the meshes of the filter cloth, resulting in an ever increasing contamination of the pasteurized milk. Replacing the cloths with fresh ones at 2-hour intervals, combined with draining the hot milk from the filter during stops, reduced the number but did not entirely eliminate them.

Filtration previous to pasteurization and at a lower temperature with changes of cloths at frequent intervals may be recommended as a means of controlling thermophiles. In fact, certain sanitary codes, like that of New York State, require that "pasteurized milk shall not be strained or filtered except through a metal strainer so arranged as to be sterilized with the bottling machine."

Examination of the coating of milk solids formed on the tubes of heaters and regenerative heater coolers revealed this at times to be a

TABLE V

THE CONTAMINATION OF PASTEURIZED MILK WITH THERMOPHILES FROM THE FILTER CLOTH  
WHERE PASTEURIZED MILK WAS FILTERED FOLLOWING A 30-MINUTE STOP

Date	Description	37° C. Plate Count	Direct Count of Thermophiles
Aug. 20, 1929	Pasteurized milk entering filter following a 30-minute stop after milk standing in the line had been pumped out	12,000	4,500,000
	Same milk leaving filter	59,000	9,000,000

veritable culture of thermophiles. It was here that the first noticeable increase in the number of thermophiles took place within the long flow holders and Electropure pasteurizers. The extent of the coating and the temperature were determining factors. The extent of the coating depended upon the kind of equipment and the method of operation. At one of the plants using long flow holders, the temperature of the circulating water in the internal tube heater was 10 to 15° higher than that of the milk. As a result, there was a large amount of milk solids cooked onto the tubes. Failure to keep the tubes bright and clean, faulty automatic temperature control and undersized heaters were factors responsible for an abnormal amount of cooking.

The development of thermophiles within the pasteurizer proved to be an important element. In the long flow holders, the inner walls of the milk tubes became seeded with thermophiles early in the run and the milk in passing through washed off ever increasing numbers. With the coil pasteurizers, a film of milk remained on the sides and bottom of the vats after emptying which contained a large number of thermophiles and served to inoculate each succeeding batch of milk. Last milk drained from vats always contained an increased number of thermophiles.

#### DISCUSSION

Control of the development of thermophiles in a pasteurizing plant must be varied with the type of equipment. With the positive hold type, it is possible to rinse the vats between runs while, with the long flow holder, this is not feasible unless a second complete set of equipment is provided for use during the washing period. With the Electropure equipment, growth in the heating chamber is not important because the temperature of 73° C. is too high to favor the development of thermophiles.

Variations in equipment and methods of operation caused each plant to present an individual control problem. Faulty plant operations proved to be more important factors in developing thermophiles than the type of equipment. At well operated plants, faulty conditions were brought under control regardless of the type of equipment.

#### SUMMARY

1. Studies on the development of thermophilic bacteria, at five large pasteurizing plants with runs of 5 to 6 hours' duration, are presented. Two of these plants used Burrell long flow holders, two Electropure flash and one Creamery Package coil vat pasteurizers.

2. An examination of the raw supply of these plants showed few thermophiles present—usually an agar plate count at 62.8° C. of less than 500 per c.c.

3. Data secured with careful and careless operation of Burrell long flow holders are presented which show that factors involving faulty plant operations, such as (1) prolonged holding of milk at pasteurization temperature, (2) repasteurization, and (3) cooking of milk solids on the walls of heaters, are the most important elements in the development of thermophiles.

4. Studies of Electropure pasteurizers at two large plants showed that conditions were not favorable for the development of thermophiles, chiefly because of the high temperatures employed and the uniform flow during operation. Where repasteurization of returned milk was practised, an increased number of thermophiles was found, although smaller than with any of the other types of equipment.

5. At the plant using the coil vats, prolonged holding at pasteurization temperature gave a decreasing 37° C. standard plate count and an increasing direct microscopic count of thermophiles.

6. Filter cloths were an important source of contamination where hot pasteurized milk was passed through a cloth used continuously for 5 hours, and where milk was allowed to stand hot in the filter during stops.

7. Each plant presented an individual control problem because of variations in equipment and methods of operation. Faulty plant operations proved to be more important factors in the development of thermophilic bacteria than the type of pasteurizing equipment.

NOTE: The author wishes to acknowledge his indebtedness to Dr. R. S. Breed of the New York Agricultural Experiment Station, under whose direction the work has been carried out and who has offered comments and criticisms on this paper.

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## Training

THE student takes something from a bottle, places it in a test tube, pours on it most any kind of acid and it turns a beautiful green. This experiment carries the label science; it is checked and the next one taken up with a certain superficial seriousness which covers over the knowledge on the part of the student that he is fooling, but getting a credit. This does not breed character. The magic word, Science, is, however, used, and something is done mechanically because the book said do it. No thought nor reason is expected or used. A certain number of carefully guarded Carnegie units are attached to it and the student goes ahead in a mechanical fashion for some more of these units so that he may enter a pre-medical course at college. He has been made to think of gain and not accomplishment, of advancement, rushed, forced advancement, and not of reason, judgment, poise, and beauty. The goal is becoming clearer. Two, three or more years of this and then medicine. There are those who can survive it, who can develop characteristics suitable for medicine in spite of it, and there are many who have not been subjected to a type of training which gives to them that which they did not have.—William DeB. MacNider, M.D., *South. M. J.*, Dec., 1929.

# Sickness Records in School Hygiene

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THE adequacy of the school medical examination, even in its more highly developed form, as a means of keeping tab on the school child's health, is properly being called into question. The principal ground for skepticism is the obvious fact that the periodic health examination takes into account only a few conditions at intervals of 2 or 3 years; it cannot promptly bring to light any conditions as they arise in the interim. Furthermore, the health examination does not and cannot, unless it is made far more searching than it is now, bring to light other impairments and defects, and it cannot conform to a fundamental postulate for accurate diagnosis, namely, the opportunity for continuous observation.

It may as well be taken for granted that practical considerations preclude a method of continuous examination and observation of millions of children that a competent diagnostician would regard as satisfactory for an individual child. What the school health administrator wants is improvement in the prevailing procedure that will result in the prompter discovery and correction or treatment of important conditions that now are not brought to light at all or with too much delay. Evidences of this desire are to be seen in efforts to improve the medical examination itself and to supplement it with more frequent inspections by teachers and nurses, and by referring conditions thus discovered for special medical examination.

Another supplementary method, which has been discussed by Collins,<sup>1</sup> and in a limited degree proposed by the American Public Health Association's Committee on Record Forms,<sup>2</sup> and employed in an even more limited extent in a few localities, is a current record of absence from school on account of sickness. The possible uses of sickness records as a supplementary method of keeping in closer touch with the health of school children have been stated succinctly by Collins, as follows:

The school sickness record would serve the double purpose of a continuous record of the health of the child and a criterion for referring children for special examination. Any child who suffers frequent attacks of illness which entail absence

from school may well be referred for examination, even though the condition is only headache, for it will enable the physician to discover in their early and preventable stages physical impairments which otherwise might be serious.

It is the purpose of this paper to report briefly the results of an experiment which had for its purpose the discovery by (1) medical examination, and (2) sickness records, of conditions that might need correction or treatment.

The experiment was conducted in the public schools of Olean, a city of about 23,000 inhabitants, in Cattaraugus County, N. Y., where for several years an experiment in rural health administration has been carried on with financial support and technical assistance from the Milbank Memorial Fund. In 1926 Edgar Sydenstricker, Director of the Division of Research of the Milbank Memorial Fund, suggested to Dr. C. A. Greenleaf, director of the Cattaraugus County School Health Service, that a record be made by the teachers as to the condition or disease causing all pupils' absences for which sickness was ordinarily given as the reason. The cause of illness was obtained from the written explanation of the child's absence signed by a parent or some responsible member of the family. In many cases the cause of absence was checked by the school nurse either by telephone or a visit to the child's home.\*

The present report is based on the experience of two school years in one graded school. During these 2 years 475 pupils were enrolled, but only those who were in attendance 1 or 2 full school years were included in the record considered here.† For convenience in summarizing the results for 2 school years, a child attending (i.e., enrolled) for 2 years is counted as 2 (i.e., 2 "years of observation") and the statistics are stated in terms of 825 children enrolled for 1 school year; throughout this paper, therefore, the term "child" means a school child observed for 1 school year although the great majority of individuals were observed for 2 years. All of the children were in the age group 5-14 years, were fairly equally distributed as to sex,

\* It was found that conditions and diseases could be entered usually by means of a simple code in the regular school registers or roll books.

The code used was as follows:

c—cold  
m—measles  
d—diphtheria  
t—tonsillitis  
u—mumps

w—whooping cough  
i—indigestion and headache  
f—scarlet fever  
h—teeth  
p—chicken pox

s—continued illness  
r—weather  
a—cause other than illness  
x—unknown

Under "continued illness" was included surgical cases, fractures, tuberculosis, heart trouble, etc. The cause of "continued illness" usually was stated.

† A few pupils entering during the first month or leaving the last month of a school year were included.

and were nearly all white native born, and of native born parents.\* The school was considered as representative of the various types of home environment such as are ordinarily found in a city of this size in the western part of New York.

Of these 475 pupils, 329 were given one "complete" physical examination; 103 were given two such examinations; about 230 were examined especially for nose and throat conditions by the school physician; and 3 tuberculosis contacts had special clinic examinations during the 2-year period. The results of an examination are related to the sickness record for the year in which the examination was made. About 30 children had no regular physical examination. All of the routine physical examinations were made by the school physician except for teeth, which were done by a dental hygienist, and for Snellen tests which were made by teachers and nurse. The examinations may be regarded as typical of the better grade of school physical examinations.

It was thus possible, for a large majority of the children, to utilize the records both of physical examinations and of sickness.† The morbidity experience and the findings of the physical examinations in the 2 school years are summarized in Tables I and II.

In general, the relative importance of the principal causes of sickness is similar to that reported by Collins<sup>3</sup> and by Sydenstricker<sup>4</sup> for children of similar ages, and thus may be considered fairly typical. The interesting and, from the point of view of this discussion, extremely significant indication afforded by this record is the fact that children were absent from school on the average nearly 4 times a school year for a total of nearly 8 school days for causes which, with few exceptions, obviously are not taken into account at all, or at least not directly by the physical examination. In mitigation of this apparent condition it may be said that the great majority of these causes are merely temporary ailments—such as "colds" and "upset stomachs"; yet it cannot be denied that as much responsibility rests upon school health authorities to see that actual cases of measles, whooping cough, tonsillitis, earache, toothache, and the like are followed up to

\* The age distributions for both and either sex were as follows:

	5	6	7	8	9	10	11	12	13	14	Total
Both sexes	84	77	72	96	97	114	103	97	50	35	825
Boys	50	41	44	39	51	62	48	38	24	14	411
Girls	34	36	28	57	46	52	55	59	26	21	414

† For this purpose the various records for each child during the 2 school years 1926-1927 and 1927-1928 were transcribed on to a single sheet which eventually contained the record of previous communicable disease incidence, immunizations, scholastic failures, record of sickness, and the results of whatever physical examinations were made during the period. The records of children who were transferred from and to other schools were completed, and the children who stopped school were followed up to ascertain the cause of discontinuance.

TABLE I

MORBIDITY AMONG CHILDREN 5-14 YEARS OF AGE BY CAUSE IN AN OLEAN, N. Y., SCHOOL,  
SEPTEMBER, 1926-JUNE, 1928

Cause of Illness	Number of Cases of Illness	Number of School Days Lost	Cases per 100 Children per School Year of 184 School Days	School Days Lost per 100 Children per School Year of 184 School Days
All causes.....	3,054	6,357.5	373.3	777.2
Measles.....	130	755.5	15.9	92.4
Whooping cough.....	22	538.5	2.7	65.8
Chicken pox.....	13	95.0	1.7	11.6
Scarlet fever.....	4	85.0	.5	10.4
Diphtheria.....	1	15.0	—	—
Colds*.....	1,468	2,404.0	179.5	293.9
Tonsillitis and sore throat.....	121	210.5	14.8	25.7
Pneumonia.....	1	41.0	—	—
Digestive diseases†.....	778	798.0	95.1	97.6
Toothache and diseases of teeth.....	268	245.5	32.8	30.0
Earache and ear diseases.....	9	28.0	1.1	3.4
Accidents.....	8	50.0	1.0	6.1
Tonsil operation.....	3	51.0	.4	6.2
Unknown diagnosis.....	214	692.0	26.2	84.6
Tuberculosis.....	2	107.5	.2	13.1
Other diseases and disorders‡.....	12	241.0	1.5	29.5

\* Includes all respiratory diseases except pneumonia and tonsillitis and sore throat.

† Includes headaches.

‡ Includes rheumatic fever, appendicitis operation, sore eyes, boils, nervous prostration, heart, undefined abscess and illness from scarlet fever inoculation.

the same extent as ear, eye, or tooth defects found upon relatively infrequent examinations. In fact, the question properly may be raised as to whether or not a child who is subject to frequent respiratory or digestive disorders, even though they may be mild, should be regarded with as much concern as if he or she had a "3x" defect of some sort.\* Table III shows the frequency of absences per school year on account of "colds" and "indigestion and headache."

Clearly, a record of sickness reveals cases that constitute legitimate problems for the school health service. Certain of these are not shown at all or, at best, indirectly by the routine physical examination; such as cases of whooping cough, measles, and other infectious diseases, frequent colds, headaches, and digestive disorders. On the other hand, it is equally clear that certain defects and impairments may not be revealed at all by a sickness record for the simple reason that they

\* Another method would be to consider cases of a given length of absence for such causes as "colds," as needing follow-up, but the frequency of their occurrence would seem a satisfactory criterion.



TABLE II

PREVALENCE OF SPECIFIC DEFECTS AMONG 535 CHILDREN 5-14 YEARS OF AGE IN AN OLEAN, N. Y., SCHOOL, SEPTEMBER, 1926-JUNE, 1928

Defect of	Condition Specified					Per Cent				
	Normal	1x	2x	3x	Defect Corrected	Normal	1x	2x	3x	Defect Corrected
Tonsils.....	264	66	77	29	99	49.3	12.3	14.4	5.4	18.5
Nose (obstruction).....	533	0	0	2	0	99.6	0	0	.3	0
Glands.....	401	133	1	0		75.0	24.9	.2	0	
Thyroid.....	440	89	5	1		82.2	16.6	.9	.2	
Nervous system.....	527	2	3	3		98.5	.3	.6	.6	
Heart.....	515	17	1	2		96.3	3.2	.2	.3	
Lungs.....	532	2	0	1		99.4	.3	0	.2	
Ears.....	529	4	0	2		98.9	.7	0	.3	
Eyes.....	461	17	15	25	17	86.2	3.2	2.8	4.7	3.2
Teeth, temporary.....	249	235	49	2		46.5	43.9	9.2	.3	
Teeth, permanent.....	400	15	98	22		74.8	2.8	18.3	4.1	
Orthopedic.....	532	0	0	3		99.4	0	0	.6	
Speech.....	528	0	4	3		98.7	0	.7	.6	
Skin.....	532	1	0	2		99.5	.2	0	.3	
Anemia.....	534	1	0	0		99.8	.2	0	0	

TABLE III

DISTRIBUTION OF 793 CHILDREN (SCHOOL YEARS OF OBSERVATION) ACCORDING TO THE FREQUENCY OF RESPIRATORY AND DIGESTIVE ATTACKS AND HEADACHES IN AN OLEAN, N. Y., SCHOOL, 1926-1928

Number of Attacks in a School Year	Colds and Other Respiratory Attacks Except Tonsillitis, Sore Throat and Pneumonia		"Indigestion and Headaches"*	
	Number	Per Cent	Number	Per Cent
0	223	28.1	408	51.5
1	202	25.5	185	23.3
2	147	18.5	82	10.4
3	88	11.1	54	6.8
4	58	7.3	26	3.3
5	26	3.3	17	2.1
6	23	2.9	8	1.0
7	7	.9	8	1.0
8	7	.9	4	.5
9	4	.5	0	—
10+	8	1.0	1	—
4+	133	16.8	64	8.1
8+	19	2.4	5	.6

\* It is realized, of course, that a more specific record as to digestive attacks, and as to headaches, would be desirable.

do not manifest themselves in actual sickness although they may eventually cause ill health. The two methods are complementary, even for those conditions which are included in both.

If the fairly common assumption were true, that a medical examination, as a method of revealing hidden defects and impairments, is an adequate means of appraising the health of the individual, one should expect a fairly consistent and high correlation between the existence of defects or impairments and the incidence of actual sickness during a period of 2 years in a group of school children. This was not found to be the case in the experience recorded. In order to ascertain how far the assumption was justified, the children in this school were divided into two categories:

(1) those found upon physical examination to be normal or to have a slight abnormality (1x), and (2) those having any defective condition serious enough to warrant notification of the parents that the condition needs attention (2x and 3x), and the general illness rates for these two classes were computed. Table IV and Figure I give the comparison by age groups. The illness rate varies according to age, as may be expected, but evidence

that it is higher among children with gross defects than among those who are free from them is by no means definite. It may be argued that this lack of association is due to inadequate examinations; possibly this is in a measure true, but our observation was that the physical examinations in this school, which were made by the director of the school health service, were done with more care than is ordinarily found in routine work of this kind.

----- This comparison may be carried a step further by comparing the prevalence of *specific* defects among 221 children suffering less than the average number of sicknesses and among 176 children who were sick frequently (5 attacks or more per year) as is done in Table V.

Now the striking fact shown by this comparison is not that the defect rates were generally somewhat higher in the "sickly" group, but that relatively a small proportion of 176 children who were actually sick 5 or more times during a school year were discovered to have *any*

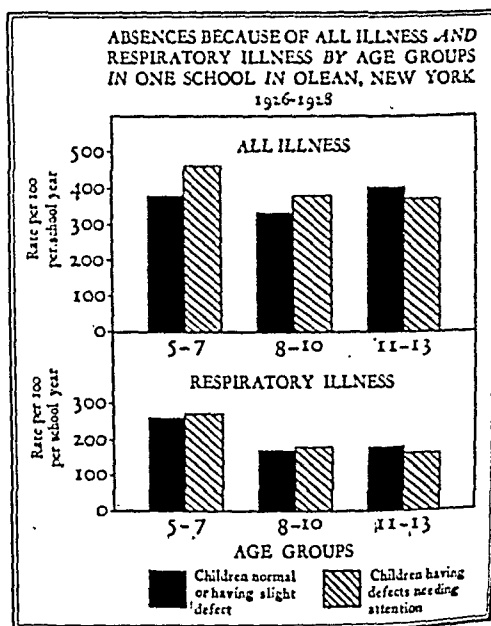


FIGURE I

TABLE IV

SICKNESS RATE AMONG OLEAN, N. Y., CHILDREN WITH AND WITHOUT SOME DEFECT  
(2x OR 3x) NEEDING ATTENTION, 1926-1928\*

Age	Rate per 100 Children per School Year of 184 Days				School Years of Observation	
	All Sickness		Sickness from Colds			
	Normal or "1x" Defect	"2x" or "3x" Defect	Normal or "1x" Defect	"2x" or "3x" Defect	Normal or "1x" Defect	"2x" or "3x" Defect
5-7	384	465	265	273	141	74
8-10	333	383	157	185	111	183
11-13	400	374	177	161	81	158

\* This tabulation includes the sickness record for both school years of all children who had a complete physical examination at some time during the 2 school years.

*serious* defects upon physical examination. In other words, the findings of the physical examination, even when considered from the point of view of specific and serious conditions, are a poor indication of the extent to which the child is actually sick.

Again, we may consider certain defects which may be reflected directly in sickness of the same specific nature, such as diseased tonsils and tonsillitis, and carious teeth and toothache. By including chil-

TABLE V

PREVALENCE OF SERIOUS DEFECTS AMONG CHILDREN SICK LESS THAN THE AVERAGE AND AMONG CHILDREN FREQUENTLY SICK IN AN OLEAN, N. Y., SCHOOL, 1926-1928

Defects	Per Cent having "2x or 3x" Defects	
	221 Children having Less than 3 Sicknesses per School Year	176 Children having 5 or More Sicknesses per School Year
Tonsils.....	15.9	23.3
Nose (obstruction).....	0	1.1
Glands.....	0	.6
Nervous system.....	1.8	1.2
Heart.....	1.4	.6
Lungs.....	0	.6
Ears.....	0	.6
Eyes.....	7.2	10.8
Temporary teeth.....	8.6	10.8
Permanent teeth.....	19.9	27.3
Orthopedic.....	.9	.6
Speech.....	.5	2.8
Skin.....	0	0
Anemia.....	0	0
Thyroid.....	.5	2.3

dren who had special nose and throat examinations in addition to the regular physical examination, we had a total of 767 children observed for 1 year. Relating the sickness record to the same school year in which the examination was made, the children were classified into two groups: those with "normal" or "1x" tonsils and those with "2x" or "3x" tonsils. In the latter group there were 163 children, all of whom presumably were referred for correction. But of the remaining 604 children with "normal" or "1x" tonsils, 59 actually suffered one or more attacks of tonsillitis or sore throat. Six of them had attacks in each of the 2 school years. A considerable number of these, if not all, properly should be considered as needing examination and probably attention. Similarly, 177 children were found upon examination to have teeth needing attention, but of the 413 children whose teeth were in satisfactory condition when the examination was made, 73 actually suffered one or more toothaches that resulted in absence from school.

Summarizing the results of the experiment, it appears true that the proposal of the American Public Health Association Committee on Record Forms to utilize sickness records as a means of discovering conditions in school children that may need treatment or correction, is a sound one in principle. A current record of sickness undoubtedly reveals many conditions which the medical examination does not bring to light. Obviously, if the sickness record is made specific enough as to cause, along the lines suggested by Collins, the information thus gained is more effective than merely a record of the number of days lost on account of illness without reference to more than a few general causes. How practicable will be the actual reference of children to physicians and clinics as the result of recording and reporting illnesses of specific kinds, is a question which must be determined by further experimentation. It is planned to make such an experiment in the near future and, if possible, to measure its results in the terms of treatments, corrections and improvement in health of the children as compared with results obtained in schools where ordinary medical examinations and school inspection alone are in operation.

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NOTE: Acknowledgments are made to Dr. C. A. Greenleaf, Director of School Hygiene, Cattaraugus County, whose interest and coöperation have made available the records used in this study, and to Mae P. Duffy, of the Cattaraugus County Health Department, who assembled the records.

# A Peep into West Indian Medical History

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*Porus, Jamaica, B. W. I.*

NOW that American citizens are taking a keener interest than ever before in the West Indies, both from the standpoints of health and commerce, a peep into the sad records and deplorable conditions of past and bygone days will, I am sure, convince readers how completely modern sanitary science has changed the medical history of these charming and picturesque islands.

Up to quite recent times, the white Northerner upon visiting the West Indies was in danger of being attacked by remittent or intermittent fever, dysentery, or yellow fever, and frequently did not survive his arrival by more than a few weeks, while the mortality among the white troops was simply staggering.

Formerly five years were sufficient for the disappearance of a white regiment of 1,000 men, and sometimes in a single year a regiment would lose 300 men.

The sanitary conditions were awful; pools of stagnant water were everywhere; and refuse matter, exposed to heat and air, accumulated and decayed in the yards, streets and barracks; in short, sanitary arrangements of any kind were nonexistent, public health duties being entirely relegated to the John Crows (vultures), and these repulsive birds, harbingers of death, could daily be seen by the scores, actively and energetically engaged in dismembering the putrefying bodies of dead animals, unmolested and undisturbed by passers-by.

Is it any wonder that less than a hundred years ago service in the West Indies was looked upon as almost certain death? Yellow fever was the chief destroying angel, with intemperance as the principal contributory cause, for many of the European soldiers took to drink at the wretched life and hopeless outlook, and deaths from delirium tremens were frequent. The salt meat they were obliged to eat caused a raging thirst which the rum bottle only aggravated. The sad story is summed up by one medical writer in the following words: "Our troops in the West Indies are killed by drinking new raw rum; and so are the lower order of mechanics and white people on the plantations."

In Jamaica in the years 1817 to 1836, the mean mortality was 121.3; the mean of the 4 healthiest years gave 67, and of the 4 unhealthiest years, 259 per 1,000 of strength. Between 1837 and 1855, the mortality had declined one-half. In 1864, the mortality was much below the home standard. In 1867, it ran up nearly to the old number from the prevalence of yellow fever, which appeared again at Newcastle and caused a greater loss than it had done in 1860. (No epidemic of yellow fever has occurred in Jamaica since 1897.)

In Trinidad and Barbados, the mortality was somewhat lower than in Jamaica, but the graves of whole battalions are still to be seen in their cemeteries, and bear silent testimony to the horrors of the past.

Toussaint L'Ouverture was doubtless an exceptional man, and rightly made use of circumstances to achieve his ends, but if history is true, Hayti owes her independence more to the malignant form of yellow fever which decimated the French and English armies than to any military genius which he exhibited. The white troops sent to Hayti from Jamaica between 1795 and 1798 were troops condemned to death, it being related that one whole regiment from colonel to drummer boy was exterminated by yellow fever, not a single man surviving. An entire French army under General LeClerc was in its turn almost annihilated by this dread malady in 1802 and 1803.

Today the mortality of the West Indies compares favorably with that of most American cities, and the white man from northern latitudes; be he American, Canadian, or European, enjoys as good health in the perpetual summer of these sunny islands as he does under his own temperate skies, provided he cultivates regular habits and avoids intemperance.

This transformation has been brought about by a more accurate knowledge of the causes of disease, and still more gratifying results will follow when the technical means of prevention are more efficiently applied.

The change which has taken place during the 20th century in the health conditions of these sun-kissed isles of the West vividly emphasizes the truth of the Latin maxim *Homini nihil utilius homine*, for this remarkable achievement has only been rendered possible by the self-sacrifice, devotion and martyrdom of members of the medical profession who concentrated their efforts on research and experimental work to the end that the human family might enjoy freedom from pestilence and disease.

# A Bacteriological Study of Grade A Pasteurized Milk

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THE Second Corps Area Laboratory, as does every other Corps Area or Department Laboratory of the U. S. Army, examines samples of milk sent to it through the mail by medical officers of some large and many small stations within its Area. The Second Corps Area Laboratory is situated at 39 Whitehall Street, New York, N. Y. It serves the First as well as the Second Corps Area; hence the region from which it receives samples takes in all of New England, New York, New Jersey and Delaware. It is evident that bacteriological examination of milk in the Second Corps Area Laboratory must perforce be done by the direct microscopic method. The method of preparing samples for shipment to the laboratory is set forth in Army Regulations 40-310, Section XII, pars. 31 and 32, which are quoted verbatim.

## *Section XII*

### SPECIMENS OF MILK

	Paragraph
General provisions .....	31
Preparation of milk for shipment .....	32

31. General provisions—The information to be gained by the examination of specimens of milk shipped to laboratories is so limited that such examinations will always be conducted locally wherever laboratory facilities are available. For specimens forwarded by mail, resort must be had to the direct-count method of determining the bacteria present rather than to the colony count. The direct-count method indicates the actual number of bacteria present and bears no relationship to the actual number of living organisms present at the time the specimen is collected. This is especially true in the case of milk that has been pasteurized. The direct-count method, therefore, is an index of past pollution rather than of the number of living organisms present, and its correct interpretation is based largely on a knowledge of the character of the milk at time of collection, whether raw or pasteurized, and on the sanitary condition of the dairy from which it came. All dairy-men supplying stations or commands will be required to furnish the surgeon of the command a quart bottle of milk, on request, at least once each month for examination. The specimen to be analyzed will be selected at random from the delivery wagon. If the specimen is not to be examined locally, the bottle will immediately

be placed on ice pending its preparation for shipment. The specimen will be shipped on the day of collection.

32. Preparation of milk for shipment—A special container, capacity 120 c.c., in mailing case, is supplied for shipment of milk specimens. The following procedure will be carried out in preparing the specimens for shipment: The quart of milk will be poured 25 times between sterile containers in order that the milk and cream may be thoroughly mixed and that clumps of bacteria may be broken up. After thorough mixing, add 1 c.c. of commercial formalin to the quart of milk and agitate thoroughly to insure inhibition of further growth of bacteria. Then fill the sterile container. It is essential that the bottle containing the specimen be filled flush to the lower end of the stopper to prevent churning of the specimen with formation of butter while in transit. Secure the stopper by binding the muslin cover in place with the copper wire. Test for leakage. Label and prepare forms as directed in paragraph 4 and note on the label the name of the dairy and the word "formalinized." Pack securely in the mailing case with absorbent cotton.

Apparently no adequate standards of direct microscopic counts of pasteurized milk exist. In fact, the application of the direct microscopic method of counting bacteria to pasteurized milk is not commonly advised. Certainly the counts arrived at by direct microscopy of pasteurized milk represent not the number of living bacteria but the number of bacteria both living and dead. To quote *Standard Methods of Milk Analysis*, A. P. H. A., 5th Ed., p. 26:

Where there is reason to expect the presence of dead as well as living organisms, as for example in pasteurized milk, it is improper to regard microscopic counts as counts of living bacteria. Valuable information may, however, be obtained by making comparative plate and microscopic counts from samples of pasteurized milk.

With this in mind and with a view of establishing standards for our own use which would enable us to interpret our routine counts, a study was made of the pasteurized Grade A milk of two of the largest distributors in New York City. Quart bottles of milk were taken from the regular morning deliveries; 10 deliveries being made over a period of 4 weeks.

Examination of the milk was begun about 2 hours after delivery. Each quart was divided into 5 parts. The first part, about 160 c.c., was examined immediately, as received. Four lots of 200 c.c. each were preserved with formalin at that time and were examined on the following day.

Examinations made of milk untreated with formalin were: methylene blue reduction test; direct-count of bacteria and leucocytes; stroke cultures of 1 : 100 dilution on the surface of blood agar plates; and standard agar pour plates, using two dilutions, 1 : 100 and 1 : 10,000. With two exceptions, the examinations were the same for the formalinized specimens. Agar pour plate cultures of the



1 : 10,000 dilution were omitted in the case of the formalinized specimens, as were also the blood plate cultures.

Because of the routine use of formalin for preserving specimens of milk received for examination by the Second Corps Area Laboratory, the influence of formalin upon the reductase tests and microscopic counts of bacteria and leucocytes in this study were of considerable interest. Four quantities of formalin were used in order to find the quantity which would least interfere in these examinations and still inhibit the growth of bacteria in the milk. The four quantities of formalin used were 0.2, 0.5, 1.0 and 2.0 c.c., each in 200 c.c. of milk, thus giving percentage solutions of 0.1, 0.25, 0.5 and 1.0, respectively.

Formalinized milk was held at room temperature for about 24 hours before examination. This insured the milk practically the same treatment as if it had been shipped from a distant station.

#### METHYLENE BLUE REDUCTION TESTS

All methylene blue reduction tests were made in duplicate, using 10 c.c. quantities of milk. The reduction time recorded is the average for the two tests. The difference in time required for reduction in the two tests was never appreciable. The time required for reduction in all the tests is shown in Table I.

TABLE I

##### REDUCTION TIME FOR ALL TESTS

Specimen	Dairy	1	2	3	4	5	6	7	8	9	10
Unformalinized	No. 1	0	X	X	X	X	X	X	X	X	X
	No. 2	0	X	X	X	X	X	X	X	X	X
0.1% formalin	No. 1	4	X	X	4½	2	1½	3	2	4	X
	No. 2	3½	3	5	3	1½	4	4½	2	4	2½
0.25% formalin	No. 1	½	0	X	X	2	2	X	X	0	X
	No. 2	X	X	X	3½	0	X	X	X	0	X
0.5% formalin	No. 1	0	0	0	0	0	X	0	0		
	No. 2	0	0	0	0	0	0	0	0		
1.0% formalin	No. 1	0	0	0	0	0	0	0	0		
	No. 2	0	0	0	0	0	0	0	0		

0—not reduced overnight

Figures—reduction in hours

X—reduction overnight

Soon after beginning this study, it was evident that the larger quantities of formalin used, 0.5 and 1 per cent, were sufficient to prevent reduction of methylene blue. Accordingly, after the 8th delivery of milk, examinations of specimens containing those quantities of formalin were discontinued.

The smaller quantities of formalin affected reduction in the opposite manner from the larger amounts. Reduction was hastened. The reduction time of the 0.25 per cent formalin-treated milk more

nearly agreed with that of the untreated milk than did the reduction time of any of the other specimens.

The figures available are too meager to do more than indicate that the optimum amount of formalin to use lies somewhere around 0.25 per cent. No ratio between reduction time of formalinized and unformalinized milk may be established. It is certain that the reductase test is of no value with pasteurized milk containing as much as 0.5 per cent formalin and it is of doubtful value when the milk contains as little as 0.1 per cent formalin. When reduction with milk containing 0.25 per cent formalin is not complete within  $5\frac{1}{2}$  hours, the milk probably contains few bacteria, but reduction in a short time does not necessarily denote a large number of bacteria. The significance of the reductase test is not indicated by this study.

### CULTURES

Blood plate cultures of 1 : 100 dilutions of unformalinized milk were made by surface stroking. Hemolytic streptococci never were found in these cultures.

Standard agar pour plate cultures of 1 : 100 and 1 : 10,000 dilutions of unformalinized milk and 1 : 100 dilution of each specimen of formalinized milk were made. The average standard plate counts in unformalinized milk were: No. 1, 5,800; No. 2, 9,800. This gives a general average count of 7,900, which is well within the limit of 30,000 allowed by the *New York State Sanitary Code*. The figures from which this general average count is derived are given in Table II.

TABLE II  
ESTIMATED BACTERIAL COUNTS PER C.C. OF MILK BASED ON COLONY COUNTS

Examination	No. 1	No. 2	
1	1,400	12,000	
2	300	9,700	
3	12,000	2,800	
4	1,500	3,000	
5	6,500	8,900	
6	(Excluded)*	17,000	
7	800	9,600	
8	11,000	13,000	
9	17,000	7,700	51,900
10	1,400	14,000	97,100
Totals	9 ) 51,900	10 ) 97,100	19 ) 149,000
Averages	5,766	9,710	7,842
	or 5,800	or 9,800	or 7,900

\* An unusual specimen. The milk contained 50,000 large, coarse bacilli per c.c. This was interpreted as either pasteurizer or bottle contamination.

In the cultures of formalinized milk, the smallest quantity of formalin proved sufficient to inhibit growth. None of the cultures contained more than three colonies.

#### MICROSCOPIC EXAMINATIONS

The microscopic examinations were quite complete. Both leucocytes and bacteria were counted. Mononuclear and polynuclear leucocytes were counted separately, as were the coccoid and bacillary forms of bacteria. The cocci and bacilli were counted both as individuals and as clumps or chains.

The technic employed was a slight modification of the Breed Method as described in *Standard Methods of Milk Analysis*, 5th Ed. The spreads were stained with Wright's stain instead of methylene blue. All counts were made as accurately as possible. With the exception of 3 counts in which 40 fields were used, counts were based on examination of 20 fields. Two spreads were made for each count, 10 or 20 fields being examined on each spread.

While the majority were fairly uniform and near the average, some of the microscopic counts varied greatly from the average. Averages of all microscopic counts are shown in Table III.

TABLE III  
AVERAGES OF ALL MICROSCOPIC COUNTS

Nature of Specimens	Individual Bacteria	Groups of Bacteria	Leucocytes
Unformalinized	1,700,000	480,000	1,400,000
0.1 % formalin	1,400,000	420,000	1,200,000
0.25 % formalin	1,500,000	480,000	1,100,000
0.5 % formalin	1,500,000	370,000	1,000,000
1 % formalin	1,500,000	420,000	840,000
General average	1,520,000	434,000	1,108,000

It may be seen in Table III that formalin makes no considerable difference in the count of bacteria, but very definitely affects the leucocyte counts, the larger amounts of formalin lowering the leucocyte counts.

#### DISCUSSION

In all, 87 specimens are considered in this study. Each of the 20 quarts of milk was divided into 5 parts, 4 of which parts were formalinized. Eight specimens were not examined. One quart (five specimens) of milk was arbitrarily excluded from consideration because of its unusual nature. This milk contained about three times as many bacteria in culture and more than twelve times as many microscopically as any other milk from either of the dairies. It is

thought that the bacteria, principally bacilli, may have been due to pasteurizer contamination; another suggestion is bottle contamination. This milk was pasteurized in Orange Co., N. Y. All the other milk was pasteurized in New York City.

The data presented show that Grade A pasteurized milk may contain millions of dead bacteria per c.c. Milk with an average plate count of 7,900 has been found to contain an average of 434,000 (roughly 440,000) groups of bacteria per c.c., about 1 to 55. Using the same ratio with a plate count of 30,000, which is allowed by the *New York State Sanitary Code*, it is found that an average of 1,650,000 groups of bacteria per c.c. may be present.

It cannot, of course, be claimed that 1,650,000 groups of bacteria per c.c. is the maximum number to be allowed for Grade A pasteurized milk. It is probably fair and reasonable to adopt the rule, at least tentatively, that pasteurized milk should not be classed below Grade A unless it contains more than 2,000,000 groups of bacteria per c.c.

In comparing direct-counts of pasteurized milk with plate counts, a high ratio must be used; certainly nothing like the ratio of 4 to 1 used for raw milk may be considered. The ratio evolved through this study, 55 to 1, has held fairly well in most of the examinations made.

An average of three and one-half times as many individual bacteria as groups of bacteria has been found in direct-counts. There seems to be no good reason to continue to count individual bacteria in future routine examinations. Groups are much easier to count and the counts of clumps and chains mean just as much as the laboriously made counts of individual organisms, at least in pasteurized milk.

Little has been gained by making separate counts of coccoid and bacillary forms of bacteria or of polynuclear and mononuclear leucocytes. No relation between the number of cocci or bacilli and the number of leucocytes was found. Three polynuclear to two mononuclear leucocytes were found quite regularly, but the cocci and bacilli were distributed very irregularly.

#### SUMMARY

Grade A pasteurized milk, part of which was formalinized, was used for reductase tests, direct-counts of bacteria and leucocytes, blood agar plate cultures and standard agar plate cultures in an attempt to establish standards to use in interpreting results of routine bacteriological examinations of formalinized, pasteurized milk at the Second Corps Area Laboratory. Eighty-seven specimens were used in this study.

Each sample of milk was examined as delivered and again after preservation with 0.1, 0.25, 0.5 and 1.0 per cent formalin. Even in the smallest amount, the formalin stopped growth of bacteria. It did not change counts of bacteria in the

microscopic examinations, but it did lower the leucocyte counts. The two larger amounts of formalin prevented reduction of methylene blue, while the smallest amount hastened reduction. A percentage of 0.25 formalin appeared to better advantage than the other quantities. The significance of the reductase test has not been shown.

The average standard plate count was 7,900.

Surprisingly high direct-counts were obtained. Roughly, averages were: 1,500,000 individual bacteria; 440,000 groups of bacteria; 1,000,000 leucocytes.

The ratio between standard plate counts and microscopic counts of groups of bacteria in Grade A pasteurized milk was found to be 1 to 55.

Pasteurized milk should not be classed below Grade A unless it contains more than 2,000,000 groups of bacteria per c.c.

Three and one-half times as many individual bacteria as groups of bacteria were found in direct-counts.

Counts of individual bacteria, counts of cocci and bacilli separately and counts of mononuclear and polynuclear leucocytes separately were not worth the effort required.

#### CONCLUSIONS

1. In pasteurized milk, a ratio of 55 to 1 may be used to compare direct-counts of bacteria with standard plate counts.

2. Grade A pasteurized milk may contain fully 2,000,000 groups of bacteria per c.c. in direct microscopic counts.

NOTE: The author desires to express his thanks to Major Joseph W. Smith, Jr., Medical Corps, U. S. A., for his criticism and assistance.

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## The Public Health Service as a Career

THE salaries . . . are not munificent, and the chief reward of public health service is to be sought in the work itself. There is a great fascination for many people in scientific enquiry and investigation in which the practice of preventive medicine provides unlimited scope. To watch the effect of one's procedure upon the progressive health of a community provides one with a solid satisfaction equal to any that can be found in other branches of practice. More fields remain to conquer, so that there is ample scope for the exercise of unlimited genius yet. Preventive medicine has long come into its own, although forty years ago and less it was the Cinderella of the profession. Public health means more and more every year to the man in the street who, while he may speak with reverential awe of the wondrous operations of some great surgeon, appreciates far more highly the measures which render such an operation unnecessary or prevent the occurrence of a disease, and there is no doubt whatever that the public health service is making good its promises, and will undergo considerable expansion yet.—Harold Kerr, M.D., *Med. Off.*, Sept. 6, 1930, p. 97.

# Incubation of the Completed Kahn Test

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IN the standard Kahn test<sup>1</sup> the reactions are read immediately after the patient's serum and antigen are brought into intimate contact during the 3-minute shaking period. Incubation periods which are part of the complement fixation and certain precipitation procedures are not required to bring about visible flocculation in the Kahn test. Because incubation periods were part of Kahn's original procedure (1922) and of tests based on the hemolytic systems, many workers erroneously make this step a part of the standard Kahn technic. This article deals with experiments to determine what part prolonged incubation of the completed Kahn test plays in influencing the final results.

The standard method of reading the Kahn reaction (immediately following the shaking period) was compared with methods in which prolonged incubation periods were used. Overnight incubation at icebox ( $5^{\circ}$  to  $7^{\circ}$  C.), room (about  $22^{\circ}$  to  $28^{\circ}$  C.), and incubator temperature ( $37.5^{\circ}$  C.), were employed in these experiments. The incubation periods varied from 16 to 20 hours.

Six hundred and ninety-three completed Kahn tests were incubated overnight at icebox temperature ( $5^{\circ}$ – $7^{\circ}$  C.), and the reactions compared with the standard method of reading. Table I shows that prolonged incubation at this temperature makes the test considerably more sensitive. Twenty-one per cent of the negative reactions became positive after this incubation period. Clinical data secured on some of the positive reactions gained showed them to be so-called

TABLE I  
INCUBATION OF 693 KAHN REACTIONS OVERNIGHT AT ICEBOX TEMPERATURE

No. Specimens	Standard Method	Icebox Temperature	No. Specimens	Standard Method	Icebox Temperature
124	++++	++++	2	+	++++
8	++++	+++	6	+	+++
5	+++	++++	7	+	++
29	+++	++++	8	+	+
4	+++	++	7	—	++++
3	++	++++	5	—	+++
4	++	+++	8	—	++
6	++	++	34	—	+
1	++	+	432	—	—

"false positives." Some of the "weaker" positive reactions gained were secured from individuals who have had intensive anti-syphilitic treatment.

Of 521 tests incubated overnight at 37.5° C., 37 per cent of the positive reactions became negative after the incubation period. One negative reaction became 1 + after this period. The majority of these reactions can definitely be classed as "false" negative reactions. Table II shows the results obtained in this group of tests.

TABLE II

INCUBATION OF 521 KAHN REACTIONS OVERNIGHT AT 37.5° C.

No. Specimens	Standard Method	37.5° C. Temperature	No. Specimens	Standard Method	37.5° C. Temperature
46	++++	++++	2	+++	+
23	++++	+++	12	+++	—
1	++++	++	8	++	—
4	++++	+	1	+	+
10	++++	—	21	+	—
8	+++	+++	1	—	+
2	+++	++	382	—	—

Nine hundred and sixty-five tests were incubated overnight at room temperature (22°–28° C.). The readings at the end of this period corresponded very closely to the results obtained by the standard method. There is a tendency for the cholesterol to precipitate out of solution at the end of this period. The presence of this cholesterol simulates the specific precipitate so closely that it may be read as a positive reaction. Three 1 + reactions became negative at the end of the incubation period and two negative reactions became 1 + and 2 + respectively. Table III shows that reactions fluctuate in either direction, although the general tendency is for the reactions to become weaker at the end of the incubation period.

TABLE III

INCUBATION OF 965 KAHN REACTIONS OVERNIGHT AT ROOM TEMPERATURE

No. Specimens	Standard Method	Room Temperature	No. Specimens	Standard Method	Room Temperature
213	++++	++++	1	+	++++
5	++++	+++	2	+	++
35	+++	+++	39	+	+
1	+++	++++	3	+	—
1	+++	+	1	—	++
5	++	+++	1	—	+
11	++	++	643	—	—
4	++	+			

## CONCLUSIONS

When the completed Kahn test is incubated overnight at room, icebox, or incubator temperatures, the character of the reactions varies materially from those obtained in reading the test in the standard method. Incubation of Kahn tests overnight at icebox temperature tends to give false positive reactions. Overnight incubation at 37.5° C. tends to dissolve formed precipitates and give negative reactions. Incubation at room temperature has comparatively little effect on Kahn reactions. It appears that most reliable results are obtained when the Kahn test is read directly after the 3-minute shaking period.

## REFERENCE

1. Kahn, R. L. The Kahn Test. Williams and Wilkins, Baltimore, 1928.

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Psittacosis

WE now have a record of 74 focuses of infection which gave rise to 169 cases, with 33 deaths, from November 23, 1929, to May 7, 1930. These cases occurred in 15 states and the District of Columbia and do not include 16 laboratory infections, with 2 deaths, nor 12 probable cases which were removed from two merchant ships entering our ports following exposure aboard ship to parrots purchased in Germany and Brazil. . . . Nevertheless, it was deemed desirable to determine the occurrence of illness among a control group of persons who had recently acquired apparently normal parrots. With this end in view, 103 parrots, a random sample, were traced to their ultimate destinations. These birds were sold by the same dealers and during the same time, November and December, 1929, as were many of the incriminated parrots. Eighty-eight of the 103 parrots were described as apparently in perfect health, and among the families exposed to them there was not a single suspected illness reported.

The remaining 15 parrots of the series either had died or were killed on account of illness. One of these birds had given rise to 6 cases of typical psittacosis. There was no human illness reported from contacts with the 14 other sick birds, of which the character of illness is of course unknown.

Parrots were associated with the development of 55 focuses of disease, parakeets with 4, "love birds" 3, canaries 3, while in 9 outbreaks exposure was to multiple species.—Charles Armstrong, Surgeon, U. S. P. H. S., *Pub. Health Rep.*, Aug. 29, 1930.





## Mobile Milk Laboratories

THOMAS PARRAN, JR., M. D., F. A. P. H. A.

*Commissioner, New York State Department of Health, Albany, N. Y.*

THE New York State Department of Health was authorized by the last legislature to make a survey of the milk supply of the state. This survey will include inspections of farms, milk plants and ice cream plants and also laboratory examinations of milk and cream as delivered to the plants and as delivered to the consumer. This work is being carried on with the coöperation of the local health departments.

The purpose of the survey is to check up on the sanitary quality of milk and cream reaching consumers in the state and to develop a plan for a more complete, effective, uniform and practical control of this supply. The results of the survey will serve as a guide for future milk control work throughout the state.

In order effectively to carry out the survey program, a laboratory for the examination of milk and cream is necessary. Two mobile laboratories are now in operation. They are equipped to make both standard plate counts and direct microscopic counts. Standard street car type buses are used with all except the driver's seat removed. The clear space inside the bus is about 7' wide, 18' long and 6' high for the installation of laboratory equipment. Laboratory benches are installed along each side and the back. A sink with running hot and cold water is

provided for washing laboratory glassware. A small water storage tank under air pressure serves as a source of water supply. Air pressure and water connections are located in the outside so that filling station service may be used. The water is heated by electricity and is stored in an insulated tank resembling a thermos bottle.

An electric meter is installed and long lead-in wires are provided for connecting with an electric power circuit. In this way, power is supplied when the bus is not running. This provides 110 volt current for operating the steam pressure sterilizer, sterilizing oven, Babcock tester for making butter fat determinations, heater for heating the bus when it is not in motion, water heater, refrigerator, fans and lights. The laboratory equipment includes an electric incubator operated by storage batteries which is automatically kept at body temperature for growing the bacteria found in milk.

Also included in the equipment are microscopes, an electric refrigerator, special gas burners supplied with compressed natural gas, and the necessary chemicals, glassware and supplies for carrying on various bacteriological and chemical tests.

All samples of milk and cream are either plated or examined under the microscope to determine the bacterial counts.

These laboratories will be stationed in each of the larger cities of the state and from these centers the survey will extend into the surrounding territory. Stops of either 1 or 2 weeks will be made, the length of the stay depending upon the amount of work to be done in each locality.

For the present, these laboratories will be used in carrying on the milk survey of the state. Eventually they will act as service laboratories, working in coöperation with health departments, milk plants and dairymen.

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## The Fatality of Scarlet Fever

A STUDY of scarlet fever in England confirms the general impression that for some 50 years past the fatality of the disease has been declining steadily. Here and there a higher mortality than expected is observed, but these few cases do not have a marked influence on the general trend.

Some of the reports are very striking—in one town, 210 cases with 1 death, in another an epidemic (number of cases not stated) with no deaths. In Liverpool, there has been a decline from 9.3 mortality per 100,000, in 1919, to 1.7 in 1929, though there were two years intervening in which the death rate had no decline. From a number of other towns there are reported epidemics with a general mortality of slightly over 1 per cent.

The reports do not seem to give any safe ground for forecasting, but they demonstrate certainly that scarlet fever is now a much milder disease than it has been in the past.

## EDITORIAL SECTION

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## THE AIRPLANE AND YELLOW FEVER

IT is well known that contagious disease travels at the rate of human transportation. Modern developments have changed many of our conditions, in some cases for the better, but in many for the worse, so our ideas and practices must be modified to meet these.

The substitution of steam for sail has brought us into very much closer contact with every part of the world, and the diseases indigenous to one country are becoming common possessions of all countries engaged in commerce.

The most recent problem is the airplane, and this has come up for discussion before the International Office of Public Hygiene, which has been attempting to draft a program to prevent the spread of yellow fever by this means. While it has been shown that the carrying of adult mosquitoes on vessels is not the danger it was once supposed to be, nothing is known of airplane conditions, though there is a rather general belief that a real danger exists. Apart from the carrying of infected insects, passengers may well carry the infection. To avoid this danger, an article in the regulations imposes on passengers from infected areas a period of observation of 6 days before embarkation, and a further period of observation of 6 days upon arrival. As all studies so far have shown that the infective period of yellow fever is only 3 days, it is possible that these proposals may be modified. The Conference of 1926 fixed 5 days as the infective period on the suggestion of Dr. Chagas, and at the last meeting of the Quarantine Com-

mission on Aerial Navigation, May 14, 1930, modification was opposed until the delegates from South America who were not present could have an opportunity of discussing this point.

There has already been established in South America a hydroplane service route along the coast across the yellow fever regions, for which the points of departure and landing are entirely on the sea. This may lessen the danger, but certainly does not do away with it, in view of the embarkation and landing of passengers. The matter is one of extreme interest and possibly great importance from the public health standpoint. New methods of transportation require new studies and new rulings.

### THE AMERICAN HEALTH OFFICER AND HIS EUROPEAN BROTHER

THIS summer, more than a hundred American public health workers visited the International Hygiene Exhibition at Dresden and called on many of their confrères in European health services. What did they observe? What did they learn? Certainly they could not have avoided an observation which to one traveler at least seemed very obvious—that American health officers are particularly fortunate to have a country like the United States in which to work. Their job is made infinitely easier and more effective because the standard of life of the great mass of people is on a relatively high level. In fact, the higher standard of living may be what has made possible most of the health work so characteristic of America today; it is part of the service which the American standard requires!

The countries of central, southern and eastern Europe present a striking contrast in this regard. To a very large extent, they appear to have overcome the immediate effects of the war. Nevertheless, one cannot avoid the conclusion that their populations are still suffering seriously from a poverty which verges very close on destitution. Housing, with the exception of a few isolated instances, as in Berlin, Vienna and Rome, is generally unfavorable to the development of good health. Illiteracy is far too prevalent, while undernourishment and malnourishment are frankly in evidence. Under conditions of this sort, it is amazing that health officers have been able to accomplish as much as they have in many European countries. Imagine the difficulties that are met with in developing a campaign against tuberculosis in the manner that it has taken hold with us. We emphasize the instruction of the people in personal hygiene and prescribe adequate nutrition, rest, good housing, and plenty of sunlight and fresh air as

preventives. Or consider the essentials in reducing high infant mortality. They call for much the same prescription plus the enforced rest of the mother during pregnancy and the necessary freedom from arduous toil later to permit breast feeding for a large part of the first year of the baby's life. To launch an effective tuberculosis or infant mortality campaign in Roumania or Greece, for example, is close to wishing the job of Tantalus on a helpless and impoverished people. Health officers can accomplish little under conditions such as prevail in most European countries.

Public health, in other words, does not stand alone. It is dependent upon the whole pattern of life. It exists as part of the life which a people can afford. It flourishes when the economic level is high; it is retarded almost to the point of extinction when standards in general are low. No one will ever be able to analyze all the factors that have entered into the extraordinary extension in life expectation and in freedom from disease which characterize the average American. Many elements have gone into making our country what it is from a public health standpoint; but obviously not the least has been the constantly advancing level of well-being for the common man and his freedom from destitution and its consequences.

We have been particularly fortunate that from the beginning it has been an article of our political faith not to stratify our population into classes. The working people made the nation, shaped the direction of government so that it included health protection, and, moreover, generated the money income which pays for such protection. On the other hand, many European countries still suffer from the implied assumption that those who work with their hands must be poor, that they belong to a lower order of nature, destined with their children to remain in that station in life to which they were born; and, worst of all—not entitled to the equal benefit and protection of governmental service. So long as such a philosophy of government holds, and unfavorable economic conditions characterize the great mass of people, death and sickness rates will continue to be high. A vicious circle is established—poverty leads to inability to support public health work and this, in its turn, makes it difficult to escape from the very unfavorable situation to which much of the poverty is due.

Health officers in the States should, therefore, realize how fortunate they are in dealing with a relatively well fed and well clothed, literate and progressive population. There is scarcely a limit to the amount of service that is available for development under such conditions. Public health work costs money. It is available to us and has proved its worth. There is little excuse for some of the unfavorable

health situations that we still have with us. The visit of our health officers to less fortunate European cities should stimulate a new spirit of activity and progressive work in many corners of our country.

## VACCINE AND VACCINATION

A WRITER in the *Medical Officer* protests against the use of the words "vaccine" and "vaccination" for any material or immunization process except calf lymph and its use against smallpox, holding that it leads to confusion and misunderstanding.

The word vaccine is derived from the Latin "vaccinus," of or from cows, this in turn being derived from "vacca," a cow. According to the etymology, the term should be limited to calf lymph prepared for protection against smallpox.

An examination of a number of American dictionaries makes this perfectly clear, but all give as a secondary meaning any substance for preventive inoculation. One of the most advertised dictionaries even includes the word "bacterin" in its definition, though we believe that this term was originated by a certain firm as a trade name.

In these days when the study of Latin and Greek is decadent, the derivation of words means little to the average reader or writer. While our sympathies are entirely with the writer in the *Medical Officer*, we must point out that usage determines the meaning and use of words. Many examples can be given showing complete changes from the original meaning; for example, "idiot," derived from the Greek word meaning a private person, and "manufacture," meaning to make by hand. At present, when manufactured articles are made by hand, the fact is usually advertised. We might now well define manufacture, to make by machinery. Language grows, and words change in meaning, but this is no excuse for the barbarisms which are so common.

# ASSOCIATION NEWS

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# PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Public Health Administration in Syracuse, N. Y.—In 1923 diphtheria immunization work began in earnest in Syracuse. From that year through 1929, there have been given 27,372 protective treatments. Except during 1924 no effort has been made to re-Schick the children to determine the extent of immunity conferred. However, of the 19 deaths which have occurred in Syracuse during the past 5 years, only 1 child among those receiving the full course of treatment contracted diphtheria and died.

In 1929, three treatments of toxin-antitoxin were administered to 8,023 children, of which number 4,255 were 5 years of age or under. In 1929 there were only 27 cases of diphtheria reported, which is less than half the number reported in 1928.

Syracuse has not had a single case of smallpox during 1929 and it is now 41 years since a death occurred from this disease.

In 1929 there were known to the Health Department 716 active cases of tuberculosis compared with 1,076 in 1928. Of the deaths in 1929, 81.4 per cent were reported as cases prior to their death. It was also found that 37.2 per cent were reported a year or more before death of the patients.—George C. Ruhland, *Annual Rep.*, Dept. of Health, 1929.

**Typhoid Fever Spread by Lobster**—During the month of July, 1929, there were 9 cases of typhoid fever in four neighboring communities, epidemiological investigation indicating that the common food had been lobster

coming from the same source of supply but distributed through four stores.

A man employed in the room in which the lobsters were handled, sorted, and stored, had died of typhoid fever early in July. The empty barrels in this storeroom were not cleaned with any regularity but were foul with slime and filth and formed ideal culture mediums for any chance contamination.

While it is not possible to state just how the lobsters became infected, it is presumed that the lack of sanitation at this packing house was the direct cause of the food becoming contaminated. It is believed that the part of the food actually consumed, that is, the lobster meat, had not been originally contaminated, but that contamination from the barrels upon the lobster shells had been transferred from the shells to the meat by the fingers of handlers in the course of preparation or consumption.—G. W. Anderson and C. L. Scamman, *Typhoid Fever Apparently Spread by Boiled Lobster*, *J. Prev. Med.*, 4, 405 (Sept.), 1930.

**Diphtheria Immunization in Detroit, Mich.**—The Health Department continues to carry on its program of prevention solely through the medium of the family physician. During the past two years, no immunizations have been given by the Health Department, not even to indigent families. The Health Department reimburses the physician at the rate of 50 cents for each dose of toxin-antitoxin for the children of indigent or near indigent families.

During the summer months of July and August, 50 school nurses did house-to-house canvassing in districts where

the diphtheria death rate is above the city average. There were 23,748 children whose parents were interviewed. Of this number 9,084, or 38 per cent, had previously received three doses of toxin-antitoxin. Of the remaining 14,664 children whom the nurses have attempted to have immunized, 5,777, or 39 per cent, have completed the course of treatment and the reports are not as yet complete. This brings the percentage of immunized children in these districts up to 62.6.

A combination of summer vacations and hard times has apparently delayed familial coöperation to some extent. Among those interviewed, 3,080, or 21 per cent, refused to have their children protected immediately because they were going away for the summer or could not take care of it on account of illness in the family. Others would not go to the family physician because they felt that they could not afford the preventive service and were unwilling to accept charity. Thirty-eight per cent definitely refused to consider diphtheria protection for their children.

It is encouraging to note that of the children immunized due to the nurses' educational program, 67 per cent were under 6 years of age. All of the immunizations were given in the office of some one of the 900 coöperating physicians, the nurses having been provided with complete lists of all such physicians.—*Detroit Health Dept. Weekly Rev.*, 11, 38 (Sept. 20), 1930.

**Health Administration in Dayton, O.**—In 1929 the per capita expenditure of the Health Department amounted to 62.4 cents compared with 44 cents in 1920. The Commissioner of Health is responsible to the Director of Public Welfare, there being no Board of Health nor advisory council. Effort is made to inspect and score the 2,565 dairies producing milk for the city each year. The 58 milk plants in which 99½ per

cent of the supply is pasteurized are regularly supervised by inspection and by laboratory analysis of the product.

Examination is made in the laboratory of utensils, such as spoons, forks, or glasses which are taken from food establishments, wrapped in sterile towels and brought to the laboratory for examination. This system is proving a very effective method of checking the cleanliness of eating and drinking utensils and bacteria count. The results of this checkup, which has been in use since 1925, are published monthly and furnished to all who desire them.—A. O. Peters, Health Commissioner, Dayton, O.

**Whooping Cough**—The positive organism in whooping cough was isolated by Bordet and Gengou 24 years ago and it has been 14 years since Chievitz and Meyer developed their simple method for early diagnosis. Whooping cough can now be diagnosed before the lymphocytosis and whoop. Two hundred cases which have been seen in private practice have been analyzed with respect to bacteriological findings. The diagnostic plate was positive in all but 1 of 53 patients in the catarrhal stage. Of 107 cases in the paroxysmal, 70 had positive plates representing 65 per cent of the total in this group. Of 40 cases studied bacteriologically in the period of decline, none showed positive plates.—L. W. Sauer, L. Hambrecht, Whooping Cough, Early Diagnosis by the Cough Plate Method, *J. A. M. A.*, 95, 263 (July 26), 1930.

**Health Examination in Newark, N. J.**—In 1929 the personnel of the Health Department totaled 235, organized into ten functional divisions, including: Administration (18), Communicable Disease (21), Venereal Disease Control (19), Tuberculosis (15), Child Hygiene (29), School Health Service for Parochial Schools (9), Laboratory (31), Food (45), Sanitation and

Plumbing (46), Dispensary (22).

The total expenditure of the Health Department amounted to \$560,000 or \$1.27 per capita, including 6 cents for plumbing inspection and 9 cents for the relief of sick poor. A total of 1,005 cases of tuberculosis with 441 deaths indicates better than average reporting for cities of this class.—C. V. Craster, Health Commissioner, Newark, N. J.

**Children's Fund of Michigan**—On April 30, 1930, the first year of the Children's Fund of Michigan was completed. Senator James Couzens of Michigan made a gift of \$10,000,000.00, dedicated to the welfare of children. Dr. Hugo A. Freund is President of the Board of Trustees and William J. Norton is Secretary of the Board.

There was organized in September, 1929, a division of child health under the administration of Dr. Bernard W. Carey, under whose direction there has been established a Child Health Demonstration in Menominee County. Two consolidated health units have been established in the lower peninsula, each of which includes four counties which, for the present, are without adequate economic resources to finance necessary health service individually.

A special oral hygiene program of extensive character has been inaugurated as well as a county nursing program, mothers' classes in child hygiene and a program of health education. In

initiating its program, the Fund has given special attention to research problems in dental hygiene, to the care of dependent and delinquent children and child guidance clinics.—*First Annual Report of the Children's Fund of Michigan*, Detroit, June, 1930.

**Meningitis in Detroit, Mich.**—Meningococcus meningitis has been epidemic in Detroit since 1928. In June, 1930, the outbreak was still continuing without evidence of early limitation. Fulminating infections were not encountered until four months after the first increase in the number of reported cases. They continued relatively uncommon during the first year of the epidemic, increased during the second year, and were most numerous during the early part of the third.

Abortive forms of meningococcus infection were encountered during the epidemic period, clinically corresponding to a mild nasopharyngitis. The disease may be limited to a septicemic stage, but is more commonly recognized as an infection of the meninges. Meningococcus meningitis may evidence a rapidly fatal fulminating course, or, more commonly, a slower evolution, or it may, in the absence of specific treatment, lapse into a chronic state with subsequent acute recurrence—J. E. Gordon and J. F. Norton, *Meningococcus Meningitis in Detroit in 1928-1930*, *J. Prev. Med.*, 4, 339 (Sept.), 1930.

# LABORATORY

C. C. YOUNG, D. P. H.

## A STERILE DISPENSING FUNNEL

G. D. CUMMINGS

*Michigan Department of Health, Lansing, Mich.*

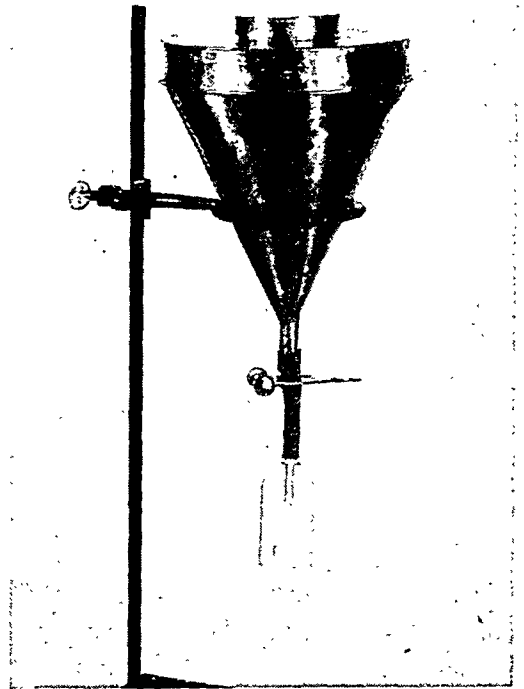
THE media division of this laboratory has used the sterile tubing funnel shown in the figure for a number of years for dispensing mediums into tubes or flasks which cannot be sterilized after the addition of enrichment substances.

Included in this group are such mediums as plain and chocolate blood agar, ascitic fluid, carbohydrate semi-solid agar, and cystine glucose agar. The procedure in the preparation of any of the above ordinarily calls for the addition to the sterilized and cooled agar or broth base of the sterile enrichment agent. Unless a suitable apparatus is available for dispensing the medium, the latter must be transferred from bottle to tube by direct pouring. This method is unsatisfactory because continual flaming usually cracks the bottle neck, and as the agar or broth to be dispensed is sometimes moderately hot the direct handling of the container is uncomfortable.

The funnel here shown is made of sheet copper and tin lined. The top is soldered on so that the opening into the funnel consists of a soldered brass collar  $2\frac{1}{2}$ " in diameter in the center of the top surmounted by a tightly fitting brass and monel metal cap. A Mohr pinch-cock, a length of rubber tubing, and a straight sided filling bell complete the outfit.

The particular funnel shown was designed to contain 1,000 mils and cost

\$2.00, including the materials and labor.



The funnel is rinsed out and washed immediately after use so that no opportunity is available for agar or gelatin to solidify inside. The filling bell is freshly plugged and the apparatus sterilized for 30 minutes at 15 lb. pressure. Once sterilized, the funnel may be placed in a cupboard until used again. Experience has shown that it

will remain sterile indefinitely.

With a battery of such funnels, the task of dispensing enrichment mediums

into tubes, flasks, or Blake bottles may be performed with great ease and excellent asepsis.

## AN AID TO MORE ACCURATE COLONY COUNTING

M. O. ROBINSON, V.M.D.

*Director of Laboratories, Scott-Powell Dairies, Philadelphia, Pa.*

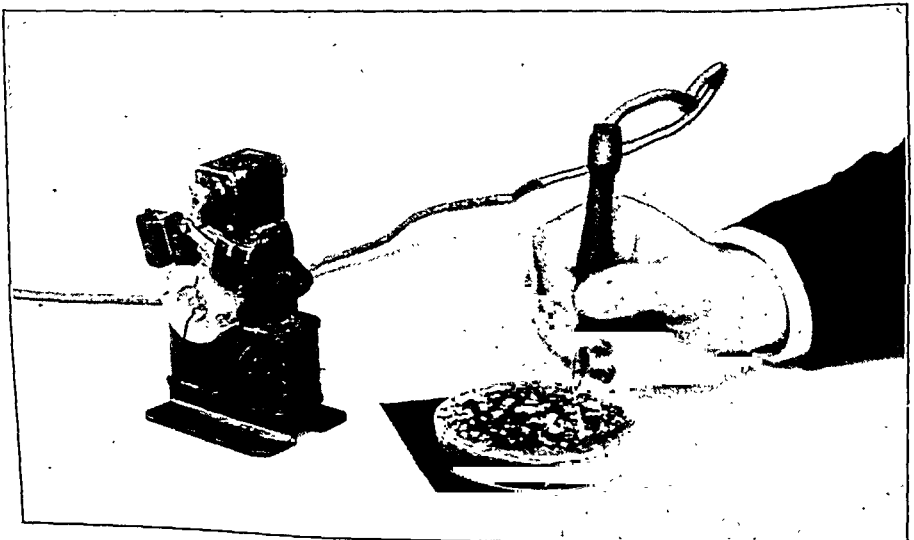
IN routine laboratory work much depends upon the individual who handles the colony counting. It has frequently come to our notice that serious mistakes are often made, and may go undetected by those in charge, due to the impossibility of making a thorough check of all the plates counted.

The workers are faced with the task of turning out accurate counts, and, at the same time, going through the monotonous routine of counting hundreds of plates each day. When we consider that practically all counts are multiplied by some dilution factor, the

possibility of grave errors in the final reports assumes large proportions.

Actually to check the work is no small problem, and probably very little checking is done.

In order to relieve the monotony, and to increase the rapidity and accuracy with which counts can be made, we have devised an electrically operated contact pen. This serves the twofold purpose of aiding the worker to turn out more accurate counts, and, at the same time, to leave upon the plate a definite picture showing the completeness with which the work was done.



The outfit consists of an electric tally apparatus, a special pen holder, and an ordinary pen point. Current is obtained directly from the lighting circuit.

Within the barrel of the pen holder there is a contact arrangement which completes the circuit when the point of the pen is pressed against the glass dish. In this way, we have the count recorded upon the tally apparatus, and the colonies which have been counted definitely marked.

Our plates are counted by placing them, inverted, over a Stewart counting chamber. The operator marks the colonies with the pen, using ordinary writing ink. In this way, a mark is

made over the colony at the time of counting, which serves as a check on the number counted, and shows at a glance the completeness with which the work has been done. This has been of great assistance in checking where large numbers of plates are counted each day, as it leaves a definite record upon each plate counted.

The adoption of the electrical counter seems to be a step ahead of other methods in use. With the count being recorded during the marking process, it reduces the possibilities of error to a minimum. We find that workers are able to count for hours, without experiencing the mental fatigue and inaccuracies of other methods.

## VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

**Health Conditions in India**—The birth rate for India in 1927 was 35.27 per 1,000, which was above the ratio of the two previous years; the death rate was 24.89, representing a fall from 1926. The infant mortality rate was 167 per 1,000 live births. Over 8,000,000 persons were treated for malaria in 1927. Respiratory diseases accounted for the highest death rate of the country, being between 8 and 16 per 1,000 population.

Tuberculosis varied from 8.4 per 1,000 for Kashipur in the United Provinces to 1.6 in the city of Bombay. There were 780,000 anticholera inoculations performed in 1927 in Bengal, which had suffered a mortality of 120,000 or an increase of about twice the usual mortality. Plague had the lowest mortality in 1927 for the last 30 years.

There has been a steady rise in mortality from smallpox since 1921. There were 2,342 deaths from rabies. The

total number of patients treated in state and private civilian hospitals and dispensaries came to over 4,600,000.—*J. A. M. A.*, 95: 603 (Aug. 23), 1930.

**The Development of Maternity Work in China**—The urgent need for midwifery training in China has come to the attention of the government. China at present has deplorably high maternal and infant mortality rates as compared with other countries. The maternal mortality is 15 per 1,000 and the neonatal mortality at least 250 per 1,000. Midwives have been a part of the social economy for years but only sporadic attempts have been made to control and register them.

Recently, a real attempt has been made and a board formed, under the Nationalistic Government, to draw up plans and regulations for schools of midwives. It is estimated that there are

200,000 old-type and 500 modern-trained midwives. To make registration possible, requirements will have to be lowered to include all the former groups. Under present conditions, China will have to be content to register about 85 per cent of those acting as midwives. But a real beginning has been made and the work will undoubtedly progress steadily in spite of political changes.—J. P. Maxwell, *Brit. M. J.*, 2: 184-185 (Aug. 2), 1930.

**Life and Death in Harlem**—A study of the 21 sanitary districts comprising the North Harlem district of New York City showed that the inhabitants have hazards two to three times as great as other inhabitants of the city. For every major cause of death, figures for North Harlem exceeded Manhattan and the city as a whole.

The birth rate for North Harlem is at least 5 per cent above that of New York City, the rates being 23.0 for Harlem; 24.4 for Manhattan; and 21.9 per 1,000 population for New York City. The infant mortality rate is 111 per 1,000 births, an excess of 65 per cent over the average city rate. The pneumonia rate is exceptionally high, 256 per 100,000. Pulmonary tuberculosis averaged 368 deaths annually with a rate of 193 per 100,000 population for the 5-year period 1923-1927. Maternal mortality in Harlem is 10.1 compared with 4.8 in Manhattan and 5.1 per 1,000 live births in New York City.

The diphtheria rate in Harlem is not in excess of the general figure, but whooping cough is in the ratio of 2 to 1 in excess for the colored. North Harlem shows a lower suicide rate than Manhattan, and a point lower than that for the city. The homicide rate for Harlem is almost double that for Manhattan, and more than 3 times the city's rate. The cancer rate is more favorable than for Manhattan. Puer-

peral diseases and malformations at birth have a higher rate but diarrhea and enteritis have a rate 2 points below Manhattan.

There were 1,839 deaths from pulmonary tuberculosis in North Harlem from 1923 to 1927, the rate for the 5-year period being 193 per 100,000, compared with 115 for Manhattan and 81 for the city. The rate for Harlem gradually increased over the 5-year period while in Manhattan it remained almost constant and in the city showed a gradual decline.—W. B. Nathan, *J. Outdoor Life*, 27: 541-544 (Sept.), 1930.

**Cancer Record for 1929**—The cancer death rate of 49 American cities increased from 71.6 per 100,000 population in 1906 to 117.8 in 1929, representing an average annual increase of about  $2\frac{1}{2}$  per cent. The number of cancer deaths in Massachusetts, where possibly the most determined effort against cancer control is in progress, increased from 5,611 in 1928 to 5,672 in 1929, in Maine, from 1,069 in 1928 to 1,120 in 1929.

Statistics for 146 cities showed the cancer rate stationary for the past two years, 114.4 per 100,000; however, the actual number of cancer deaths in these cities increased from 43,426 to 44,262. Of these 146 cities, Portland, Me., reported the highest cancer death rate in 1929, 187.5 per 100,000 population. In the five cities with populations over 1,000,000 or more, the number of cancer deaths rose from 16,120 in 1928 to 16,481 in 1929. Philadelphia reported a rate of 126.3 in 1929; Los Angeles, 124.9; New York, 113.9; Chicago, 106.1; and Detroit, 73.1.

In 1928, cancer had reached the status of being the third leading cause of death in the United States Registration Area, the rate being 96 per 100,000 according to the U. S. Bureau of the Census. The cancer rate for 17 Euro-



pean countries for the period 1921-1927 showed a range of from 141.9 per 100,000 for Switzerland to 61.8 for Italy. For the same 7-year period in 9 non-European countries, the rate reached a maximum of 90.6 per 100,000 in Australia, and a minimum of 12.3 for the Republic of Salvador. In practically all of these countries, the cancer death rate continued to increase from year to year during the period dealt with.

Two illustrations show the nature of the local cancer problem as to organs affected. The proportion of deaths from cancer of the buccal cavity in the total mortality from all forms of cancer varied, for males, from 50.4 per cent for Ceylon, to 2 per cent for Chile. The proportion for the white population of the United States was 6.1 per cent; for American negroes, 5.6 per cent; for American Indians, 5.5 per cent; and for American Chinese, 2.3 per cent. The range for cancer of the stomach and liver, for males, varied from 83.4 per cent for Japan to 22.5 per cent for Ceylon. United States showed proportions from 44.8 per cent for the white population to 59.6 per cent for American Chinese.—F. L. Hoffman, *Spectator*, 125-3-20 (Aug. 14), 1930.

#### MORTALITY STATISTICS: 1929

*Pennsylvania*—The Department of Commerce announces that there were 117,365 deaths in Pennsylvania during 1929 as compared with 119,607 in 1928.

For the 4-year period 1926 to 1929, marked decreases were shown for measles, from 1,058 deaths in 1926 to 367 in 1929; typhoid and paratyphoid fever, from 357 to 199, whooping cough, from 927 to 575, and diphtheria, from 800 to 689. Deaths from tuberculosis, all forms, diarrhea and enteritis, under 2 years, and congenital malformations and diseases of early infancy showed continual decreases from 1926 to 1929.

The deaths reported from meningococcus meningitis in 1928 and 1929

were nearly 3 times as many as in 1926 and 1927. The four outstanding causes of deaths were diseases of the heart, pneumonia, all forms, nephritis, cancer and cerebral hemorrhage.

While the deaths from all accidental unspecified external causes showed a total increase of only 83 in 1929 as compared with 1928, those from automobile accidents increased by 277 and from machinery accidents by 38; these increases were principally offset by decreases in deaths from drowning, mine accidents, and railroad and street car accidents.

*Wyoming*—There were 2,010 deaths in Wyoming during 1929 as compared with 2,155 in 1928.

A comparison of the deaths in 1929 with those in 1928 showed decreases in such important causes as whooping cough, influenza, tuberculosis, all forms, cancer, cerebral hemorrhage, pneumonia, all forms, and nephritis.

Increases in deaths from 1928 to 1929 appeared for syphilis, appendicitis and typhlitis, and diseases of the heart; for the last cause the increase has been continuous from 1926.

The deaths from accidental and unspecified external causes increased from 253 in 1928 to 284 in 1929, the greatest increase among these appearing for automobile accidents (59 to 73).

*Massachusetts*—Massachusetts has reported 51,916 deaths during 1929 compared with 51,034 in 1928.

Diseases of the heart alone caused over one-fifth of all deaths reported in the state and show an increase for each succeeding year.

Deaths from influenza and its associated disease, pneumonia, were 900 more in 1929 than in 1928, and this combination of diseases was the cause of the second greatest number of deaths.

For the 4 years 1926-1929, cancer has shown a continuous increase from year to year and now ranks as the second single greatest cause of death.

The diseases mentioned above, with

cerebral hemorrhage and softening, and tuberculosis, which has shown a decrease for each of the 4 years reported, caused approximately three-fifths of all of the deaths reported for the year. In addition to tuberculosis, decreases from 1926 to 1929 were shown for diarrhea and enteritis, under 2 years of age, nephritis, and congenital malformations and diseases of early infancy.

In the epidemic diseases, decreases were in measles, scarlet fever, and whooping cough.

Among accidental and unspecified external causes, deaths from drowning decreased from 315 in 1928 to 254 in 1929. Deaths due to accidental falls increased from 731 to 772. There was a slight decrease in the number of deaths due to street car accidents, and the number due to automobile accidents increased from 724 to 781, a continuous increase for each of the 4 years.

*Minnesota*—There were 25,092 deaths in Minnesota during 1929 as compared with 25,977 in 1928.

Though the total number of deaths in this state has remained practically the same for the 4 years 1926–1929, there have been a number of decided changes in the diseases causing death. For the years 1929 and 1928, the numbers of deaths due to influenza were nearly double the numbers reported from 1926 and 1927. These large increases and the increase due to deaths from automobile accidents more than offset the decrease due to deaths from other causes. The number of deaths from measles increased from 13 in 1928 to 84 in 1929, but this latter figure compares very favorably with the 175 deaths from this disease in 1926. The great decrease in deaths from diphtheria during the 4-year period is very satisfactory and is in step with similar reports from other states. Cancer is each year taking a larger toll of deaths and next to diseases of the heart is the outstanding cause of death.

The important diseases for which less deaths were reported in 1929 than in 1928 were acute anterior poliomyelitis, 59 to 6; diarrhea and enteritis, under 2 years of age, 198 to 135; puerperal causes, 280 to 201.

The decrease in deaths from railroad and street car accidents was more than made up by the deaths from automobile accidents.

*Vermont*—The Department of Commerce announces that there were 5,295 deaths in Vermont during 1929 as compared with 4,888 in 1928.

The causes which took the greatest toll of life were those diseases which affect persons of older ages, namely, diseases of the heart (1,092), cerebral hemorrhage and softening (516), cancer (465), and nephritis (445). The first two causes alone were responsible for nearly one-third of the deaths in the state.

The deaths from influenza in 1929 more than doubled the number in 1928, and other increases were from pneumonia, all forms, and diarrhea and enteritis under 2 years. Decreases were shown for tuberculosis, all forms, and diabetes mellitus.

Among the deaths from accidents, decreases appeared for drowning, machinery accidents, and automobile accidents, and increases for burns and shooting.

*Kentucky*—There were 31,109 deaths in Kentucky during 1929 as compared with 30,390 in 1928.

Very appreciable decreases in deaths in 1929 as compared with 1928 appeared for typhoid and paratyphoid fever, measles, syphilis, pellagra, diarrhea and enteritis, under 2 years, and congenital malformations and diseases of early infancy, and comparatively slight decreases were shown for tuberculosis, all forms, cancer, pneumonia, all forms, and nephritis.

Notable increases were those from influenza, which in 1929 caused nearly twice as many deaths as in 1928, and

from meningococcus meningitis, which more than doubled the number of deaths in 1928. Other increases were reported from scarlet fever, whooping cough, diabetes mellitus, and diseases of the heart, the last of these being the outstanding cause of death.

Total deaths from accidental and unspecified external causes showed only a slight increase in 1929 over 1928, but the increase in automobile accidents was large (342 to 389) and accidental shooting and railroad accidents also showed a larger number in 1929; a noticeable decrease was reported in deaths from mine accidents.

*Michigan*—Michigan has reported 56,118 deaths during 1929 as compared with 54,794 in 1928.

The total increase in deaths in 1929 as compared with 1928 was 1,324, nearly half of which was accounted for by the appalling increase in deaths from meningococcus meningitis, from 189 to 812, and two-thirds of these deaths occurred in Detroit alone (542). Other increases were shown for diphtheria, influenza, diseases of the heart, appendicitis and typhlitis, cancer, and diabetes mellitus; for the last two of these causes the increase was continuous from 1926. The deaths from suicide also increased during each year for this period.

Notable decreases from 1928 to 1929 appeared for measles, scarlet fever, pneumonia, all forms, and nephritis.

The deaths from accidental and unspecified external causes increased in

1929 as compared with 1928, the principal increases appearing for accidental drowning and automobile accidents; decreases were shown for railroad and street car accidents.

*Kansas*—The Department of Commerce announces that there were 19,392 deaths in Kansas during 1929 as compared with 20,946 in 1928.

While deaths from typhoid and paratyphoid fever and measles showed increases in 1929 over 1928, there was a very big decrease from 1926, and whooping cough, which showed a decrease from 1928 to 1929, 91 to 80, was responsible for 120 deaths in 1926.

The most notable decrease in deaths in 1929 as compared with 1928 was that from influenza from 1,472 to 869; other very important decreases were from tuberculosis, all forms, cancer, diseases of the heart, pneumonia, all forms, diarrhea and enteritis, under 2 years, nephritis, and cirrhosis of the liver.

Among increases in deaths were those from meningococcus meningitis, scarlet fever, and diabetes mellitus.

The increase of 131 deaths from 1928 to 1929 from accidental and unspecified external causes was more than accounted for by increases in deaths from accidental drowning (75 to 85), accidental shooting (41 to 70), mine accidents (16 to 24), machinery accidents (31 to 50), and automobile accidents (304 to 373).—U. S. Department of Commerce, Bureau of the Census. Provisional Summaries.

# PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

**Mosquito Control on Water Supply Reservoirs**—Mosquito control may be effected by clearing the edges of ponds or reservoirs to eliminate floatage, by varying the water level 6"-8" to strand larvae, by destroying the larvae with *gambusia affinis*, and by the use of mineral oil. The use of mineral oil is claimed to be unobjectionable to water users. It is generally used in the upper reaches of the pond or reservoir and remains on the surface, whereas intakes are usually below the water surface.—E. W. Constable, *Water Works Eng.*, 82, 1929. From papers of Water Pollution Research Board, England.

**Some of the More Recent Aspects of Sewage Chlorination**—The amount of chlorine to be added for the proper disinfection of sewage varies with conditions of sewage and temperature, but 0.2 p.p.m. should be present after 10-15 minutes. Solution feed is recommended in preference to direct feed apparatus, since, when over 3.5 p.p.m. of gas are fed directly, damage to equipment may result from escaped gas. Chlorine may be added either to the plant influent or effluent. Direct feed apparatus may be used when an addition of not over 3 p.p.m. of chlorine is required. Disintegration of concrete, often due to the presence of hydrogen sulphide, may be prevented by chlorination.

Prechlorination is claimed to have no harmful effects on sludge digestion, but rather to hasten it, prevent foaming in Imhoff tanks, and reduce the 5-day biochemical oxygen demand of sprinkling filter effluents. The construction of secondary treatment facilities may be

postponed or avoided by chlorinating the effluent from settling tanks.—L. H. Enslow and J. A. Strange, *Fourth Annual Report of the Missouri Water and Sewerage Conference* from Papers of Water Pollution Research Board, England.

**Engines Run on Sewage Gas**—At the sewage works of Charlotte, N. C., gas is collected which contains about 70 per cent of methane, averages about 800 B.t.u. per cu. ft. in calorific value, and amounts to about 0.3 cu. ft. per head of the population per day. The gas is utilized in internal combustion engines and the heated water from the jackets is used, supplemented in cold weather by exhaust gas heaters, to maintain the required temperature in the sludge digestion tanks. A 10 per cent reduction in operating expense has been effected by the use of the gas.—*Power*, 69, 1929. From papers of Water Pollution Research Board, England.

**The Treatment of Water and Waste Water with Chlorine and Copper and Chlorine and Silver**—An apparatus is described and illustrated for the simultaneous addition to water of chlorine and copper or silver. Chlorine gas passes from a cylinder through a control system to a vessel where it is dissolved in a small quantity of water. The solution can be divided as required, part passing directly to the water to be treated, while part passes through another vessel containing silver and copper waste, carrying some of this in solution to the water.

Experiments are described on the

treatment with chlorine and copper of the water for use in a cellulose factory and the effluent from a paper factory. In the first case the water was drawn from a river so much polluted with trade wastes that neither chlorine nor copper sulphate sufficed to control growths of fungi and algae.

Combined treatment with 2.5 gm. of chlorine and 0.18 gm. of copper per cm. of water was entirely successful. Intermittent treatment of the clarified effluent from a paper factory was successful in preventing growths in a stream. The chlorine and silver combination was tested in river water with a very high content of bacteria and suspended matter.

Tests were made of the raw water and of the water after chlorine alone and silver and chlorine had been added on the suction side of the pump drawing from a well. The results of the bacterial counts and the coli-titer are given in tables. At first the quantities of silver were too small to increase the effect of the chlorine, but on raising the quantity of silver or adding ammonia the chlorine effect was increased.

The amount of suspended matter caused slowness in the action, but when the water was filtered sterilization took place much more quickly.—G. Ornstein and R. Kroke, *Gesund-Ing.*, 53, 1930. From papers of Water Pollution Research Board, England.

**Pollution of Abandoned Well Causes Fond du Lac Typhoid Epidemic**—An account is given of the report of Warrick and Tully on the cause of the typhoid outbreak at Fond du Lac, Wis., in 1929. The water supply is drawn from wells, five of which are situated at the water works. Bacterial examinations proved these wells to be polluted.

Information was received of the existence of an abandoned private well in a new channel of the Fond du Lac

River, some 800 ft. from the wells. The river receives tannery waste and sewage. Salt tests gave evidence of underground connection between this well and the wells at the works.

The old well casing was treated with chloride of lime and air tests were made for seams in the river channel. The old well was then filled with concrete and capped, the reservoir was cleaned and disinfected and the water mains flushed.

The discharge from the water works wells improved immediately the old well was capped, but all city water is now chlorinated and private wells in the neighborhood are carefully tested and controlled.—*Eng. News-Rec.*, 104, 1930. From Papers of Water Pollution Research Board, England.

**Bacterial Contamination of Baths**—Examinations of samples of water from swimming pools which are not subjected to filtration or chemical treatment, and from those which are treated by continuous filtration and chlorination, have shown that *B. coli* multiply rapidly during the night in swimming baths, but streptococci do not. It is suggested that a better index of pollution is formed by an estimation of streptococci by glucose and lactose broth than by an estimation of *B. coli*. It is concluded that while the *B. coli* content is not a universally reliable index of intestinal pollution, streptococci are constant indications of such pollution, and that although *B. coli* do not necessarily indicate pollution or danger, their absence is an excellent index of safety.—*Brit. M. J.*, 3593, 1929. From papers of Water Pollution Research Board, England.

**Treatment of Dairy Wastes**—The strength of milk-product waste depends primarily upon the buttermilk and whey content and may be 10 times the average for domestic sewage. The treatment of weak and concentrated dairy waste

is discussed. Reference is made to previous investigations which have shown that Imhoff tanks are unsatisfactory but that a purification of 80-98 per cent, based upon the organic nitrogen, is effected by septic tanks with 24-72 hours' detention, followed by sand or trickling filters. Concentrated wastes can be recovered, utilized as hog food, or dried.

Experiments were carried out on the chemical treatment of concentrated wastes at two New York State plants; 0.5-1.0 per cent of 95 per cent lime by weight was added to the raw waste, which had an acidity ranging from 1,000-6,500 p.p.m.

The sludge dried readily on sludge beds to about 46 per cent moisture and the clarified effluent showed a reduction of 86 per cent in organic nitrogen and 82 per cent in oxygen consumed.—C. L. Walker, *New York State Sewage Works Assn.*, Oct., 1929. From papers of Water Pollution Research Board, England.

**Water Supply and Sewerage of Large Japanese Cities**—The author gives an account of the water supplies, sewerage systems and sewage treatment works of the large cities of Japan. Water works methods are up to date and a high standard of water is generally supplied. Surface water treated by slow sand filtration is most usual, but rapid sand filtration is being introduced.

Sewerage systems have reached a high degree of development though the sewage in most cases is discharged without treatment. One full-size activated sludge plant is almost completed at Nagoya and the process is being tried on an experimental scale at other places.—H. E. Babbitt, *Eng. News-Rec.*, 104, 1920. From papers of Water Pollution Research Board, England.

**Flat Clarification Tanks with Sludge Scrapers**—Flat settling tanks

with mechanical arrangements for frequent removal of sludge during operation are being generally installed in Germany. Three forms of scraper are described: (1) a continuous chain scraper used in a narrow rectangular tank to push the sludge against the sewage stream to a sludge reservoir at the inlet end; (2) a scraper carried on a travelling bridge, also used in a narrow tank to push the sludge to the inlet end; (3) rotary scrapers for large tanks either square or circular, moving the sludge to a central collecting tank. For this purpose circular tanks with central inlets are most efficient and economical.

Rectangular tanks necessitate a complicated construction of scraper to reach the corners. Central inlets have the advantages of slower average flow for the same retention time and settling of the heaviest sludge near the sludge chamber. Even distribution of incoming sewage is of great importance. This can be achieved by surrounding the inlet with a circular screen of triangular wooden laths with their apexes outwards.

A detailed illustrated description is given of a circular clarification tank, 30 m. in diameter, with a rotary sludge scraper, at Essen-Nord, which treats sewage containing at times very large quantities of light watery sludge, due to iron pickling and chemical wastes. The sewage enters through a wooden lath screen and heavy solids are at once deposited in the sludge tank, lighter matter being carried over to the clarification tank proper.

Owing to the danger of earth movements due to mining, the sludge scraper is carried on floating pontoon bridges and the junctions of the actual scraping parts are all flexible so that they can accommodate themselves to unevennesses in the tank floor. Scum is moved by hand into a channel carried by the scraper floats, and deposited in the sludge collecting tank. The sludge at the bottom of the collecting tank is

forced up pipes by the pressure of the water and deposited in a tank above the collecting tanks. By this means a sludge with a water content of 88-90 per cent is obtained.

Plans are described for a larger tank of this type, 45 m. in diameter. As a single sludge scraper of this length would have too slow a movement in the center, the tank is to be divided into an inner and an outer circle, and the small quantity of light sludge deposited in the outer circle will be moved, by a separate scraper running on rails, to sludge tanks under this outer tank, from which it will flow to the central collecting tank. This will also have the advantage that any sludge stirred up by a too rapid movement of the inner scraper will settle and be removed in the outer circle.—M. Pruss, *Gesund. Ing.*, 53, 1930. From papers of Water Pollution Research Board, England.

**Chlorinated Drinking Water: The Use of Activated Charcoal Filters—**The only drawback in connection with the chlorination of water is that of taste production. In the presence of the most minute traces of phenols, chlorine produces an objectionable taste and odor in the water.

The simplest control, elimination of the phenols, is practically impossible due to their varied sources. Furthermore, due to this variation it is impossible to control them from the sewage treatment side. The logical control is at the water purification plant. The process giving the best results, thus far, is filtration of the water through activated charcoal.

An experimental plant of 25,000 cu. m. daily capacity was installed by the

Ruhrverband. This plant has been in use for several months and has given good results in removal of chlorophenol tastes as well as tastes caused by algae and mineral constituents. This experimental charcoal filter is described in detail.—Karl Imhoff and F. Sierp, *Surveyor*, 76, 1963: 225 (Sept. 6), 1929. From *Pub. Health Eng. Abstr.*, Mar. 29, 1930. Abstr. F. E. DeMartini.

**The New Refuse Disposal Plant, Chapman Street—**At the new 120 ton refuse disposal plant which replaces the old destructor, everything of value is salvaged and only valueless refuse burned. The refuse is tipped from the collecting vehicles into a hopper and is carried by a continuous plate conveyor to an elevator which lifts it to the long rotary screen. This has a 12 ft. section with 5/16 inch perforations which pass small particles, and 6 ft. of 1½ inch holes through which fall principally cinders. The brass extension to the screen has electro-magnetic coils on one side which separate out the tin cans, which are then chuted to the baling press.

The remainder of the refuse is conveyed on a rubber belt to the firing floor of the incinerator, and paper, glass, bones, etc., are hand picked off the belt. The tailings are burned in a specially designed incinerator to heat steam boilers which drive dynamos that generate the current for the plant and an excess which is sold.

The plant also includes a paper baling press, a clinker crusher, and a mortar mill.—Anon., *Health News*, Hull Corporation, England, 2, 12: 1-2 (Sept.), 1929. From *Pub. Health Service Eng. Abstr.*, Mar. 1, 1930. Abstr. A. W. Fuchs.

# INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., AND LEONARD GREENBURG, PH. D.

**Pocket Reference of Information on Occupations**—This little booklet, prepared by the U. S. Bureau of the Census chiefly for undertakers and registrars of vital statistics, explains the new requirements which relate to occupations and the census of occupations made in 1930.

The new death certificate which has been introduced in the past year or so is to be the one used from 1930 on, in the entire death registration area, which now composes 95.8 per cent of the population of the United States. The headings which refer specifically to occupations are as follows:

Trade, profession or particular kind of work done, as spinner, lawyer, bookkeeper, etc.

Industry or business in which work was done, as silk mill, saw mill, bank, etc.

Date (month and year) deceased last worked at this occupation. Total time in years spent in this occupation.

A study of death rates by occupation, such as that planned in connection with the 1930 census, would not be limited to those deaths directly traceable to occupational activities; it would go considerably further, and be perhaps comparable to the report to the British Registrar-General, issued for England and Wales. It is realized that adequate reports on occupations will influence insurance rates, workmen's compensation laws, industrial hygiene activities, and the changes brought about in industry by employers, while it would, of course, make it possible to compare the death rate of workers by occupations and by localities.

While the undertaker is responsible for filling out the blank originally, the local registrar is to review the occupa-

tional returns and refer them back where not completed or where the facts are known to be otherwise than stated.

The pamphlet contains a list of instructions to enumerators who took the 1930 census in reference to the questions above, which will be of assistance to those who fill out the death certificates. There is an extensive list of undesirable terms which are to be avoided, and the reasons therefor.

In preparation of the booklet, the valuable services of the National Tuberculosis Association were used, while the revised standard certificate of death was approved at the meeting of the A. P. H. A. in Chicago, October, 1928, and by the conference of State and Provincial Health Authorities, in Washington, in June, 1929.—E. R. H.

**Anthraxis**—This disease is differentiated from emphysema by the absence of a deformed thorax and alteration of the general condition. Gray sputum is more common than black sputum usually mentioned. Physical signs do not indicate pulmonary induration.

The radiologic signs indispensable for a diagnosis are bilateral lesions at the base and around the hilus, disseminated and nodular at first, but later confluent and encircled by an area of emphysema.

Silica is not a common substance found in coal mines, yet sclerosis among miners is frequent. Nor are bronchitis and emphysema essential factors of sclerosis.—Belgium Letter, *J. A. M. A.*, 95, 10: 741 (Sept. 6), 1930.—E. R. H.

**Asbestosis Bodies in Sputum and Lung**—While the asbestos industry is more than 2,000 years old, it is only



within the past few years that it has assumed the prominent place which it now occupies in the industrial arts. Until recently asbestosis has been assumed to be essentially silicosis, and the free silica thought to constitute the dangerous factor. (A brief review of bibliography on the subject is made, beginning with the article in 1924 by W. E. Cooke in the *British Medical Journal*, July, 1926.)

In October, 1929, the present authors autopsied a negro patient, dead of a gun shot wound, who had worked for 28 months during a period of about 3 years in an asbestos mill (Charleston, S. C.). Microscopic examination of lung tissues, peculiar bodies were found in sections from both lungs, which are considered characteristic (two illustrations accompany). At about the same time another autopsy was performed on a negro who also died of lobar pneumonia and who had been working in an asbestos mill for  $4\frac{1}{2}$  years. Again the "asbestosis" bodies were found on microscopic examination of the lung sections. Following this, search was made for the bodies in the sputum of asbestos workers, where they were readily found in wet slide preparations and in large numbers in a sodium hydroxide digest concentrate.

Examination of a man who had worked 14 years in an asbestos factory, but not since 1926, failed to reveal the bodies. It was found the bodies do not take the ordinary tissue and sputum dyes but may be found in their natural form in slide preparations already stained for the tubercle bacilli. An unexplained iron content of the bodies was also brought out by certain stains.—K. M. Lynch and W. A. Smith, *J. A. M. A.*, 95, 9: 659–661 (Aug. 30), 1930.—E. R. H.

**The Occurrence of Pulmonary Fibrosis and Other Pulmonary Affections in Asbestos Workers**—This very interesting contribution presents

the results of a study of the health hazard among asbestos workers. In addition to the presentation of clinical data and X-ray pictures the morbid anatomy of the disease and dust findings in the industry are clearly set forth.

It is pointed out that asbestosis differs from ordinary silicosis both in the gross morbid pathology and X-ray examination. For this reason it is correctly argued that X-ray pictures of the chest of asbestos workers must not be interpreted in terms of the X-ray picture of the worker in other dusty trades.

As in the case of other dusts the end result varies directly as the length of employment and the dust concentration. With high concentrations the disease may be developed in from 7 to 9 years and may cause death in 13 years. The author concludes that further investigation is required in order to decide whether or not there is any increased susceptibility to pulmonary tuberculosis due to the inhalation of asbestos dust or the presence of asbestos fibrosis.—E. R. A. Merewether, *J. Indus. Hyg.*, 12: 198–222, 239–257 (May and June), 1930.—L. G.

**Health Service Policies**—This is *Health Practices Pamphlet No. 12*, published by National Safety Council, 20 N. Wacker Drive, Chicago, Ill., and includes a study of prevailing practices based upon answers received from 191 clients, companies and their physicians. The personnel of the various plants is analyzed by groups and the types of service rendered—preventive, curative, and related activities—are classified. A composite picture gives the average features respecting industrial medical services in these plants (20 items, too long to enumerate in this place).

It was found that only 5.3 per cent of 3,580 selected industrials reported on some form of medical and health supervision of their employees. Thus, approximately 3,406,000 employees were

not reported upon as compared with 1,615,193 who were, as having health service provisions.

The minimum requirements for a health service are summarized as follows:

1. Pre-employment physical examinations
2. Treatment for minor illnesses
3. The service of a part-time physician
4. The service of a full-time dispensary nurse

The maximum requirements compose a discussion of 13 items, given in some detail.—E. R. H.

**Studies in Illumination. III—A Study of the Loss of Light Due to Smoke on Manhattan Island, New York City, During the Year 1927, Especially in Its Relation to the Nature of the Weather, the Relative Humidity of the Air, and the Velocity and Direction of the Wind.**

For this purpose, records were made on the roof of the U. S. Marine Hospital, at the lower end of Manhattan Island, where the air was unusually smoky, and on the roof of the U. S. Quarantine Station on Hoffman Island, about 9 miles distant in lower New York Bay, where the air was comparatively clear.

Determinations were made with a photo-electric cell connected to a recording potentiometer. The photo-electric cell had been previously calibrated with a Macbeth illuminometer. It was only necessary to multiply the reading of the tracing stylus by 177 to obtain results in approximate foot-candles. In general, agreement was found with Kimball's contention that illumination is approximately proportional to the total radiation. The records were made during the year 1927, over a period of 286 days.

The highest average daily illumination at Hoffman Island occurred in June and the lowest in December. The greatest total loss of light on lower Manhat-

tan was in July and the least loss was in December. There was a large relative loss of light due to smoke—in some cases greater than 50 per cent.

The average percentage loss of light for the whole year was 16.6 for clear days, 34.6 for cloudy days, and 21.5 for all days. The percentage loss on cloudy days was about twice as great as on clear days.

The average percentage loss throughout the year was 30.2 at 8:30 a.m., 16.5 at 1:30 p.m., and 21.0 at 3:30 p.m.

The average monthly percentage losses showed no marked seasonal effect but did show a marked relation to the average monthly relative humidities, the percentage losses usually increasing and decreasing with the relative humidities.

Other conditions being the same, the percentage loss of light was found to decrease as the velocity of the wind increased.—James E. Ives, *Pub. Health Bull. No. 197*, 40 pp., 1930.—E. R. H.

**Occupation and Health**—The brochures which have been received under this heading from Nos. 206–212, inclusive, are as follows:

- No. 206, Flour Mills
- 207, Garages
- 208, Industrial Health (Propaganda)
- 209, House Porters
- 210, Industrial Lighting
- 211, Industrial Physiology
- 212, Jute

As stated in the September issue, brochures in this *Encyclopedia of Hygiene, Pathology and Social Welfare, Studied from the Point of View of Labour, Industry, and Trades* are said to be now completed through the letter "E" (Brochure No. 199). The price of the complete Brochure Edition is \$16.00 and may be purchased through the Book Service, American Public Health Association. The work is prepared by special committees under the auspices of the International Labour Office, Geneva, Switzerland.

# FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

**The Williams-Waterman Vitamin B<sub>3</sub>**—This experiment was undertaken to supply information on the vitamin B<sub>3</sub> factor described by Williams and Waterman in the case of pigeons in contradistinction to the vitamin B<sub>3</sub> factor reported by Reader in the case of rats. The relative potency in certain foods in the vitamin B<sub>3</sub> factor was determined by feeding adult pigeons a synthetic diet adequate except for vitamin B complex, until symptoms of polyneuritis appeared, when an adequate amount of the vitamin B<sub>1</sub> factor was added.

The food to be tested was supplied and effect on growth and weight noted. These tables show beef liver and lean beef to be superior in the B<sub>3</sub> factor to milk, fruit and vegetable juices. Where the food was also deficient in B<sub>1</sub> weight restoration did not take place, showing this factor as well as B<sub>3</sub> to be essential in this respect. Vitamin B<sub>3</sub> factor in yeast is reduced markedly with alkaline treatment and in malt extract by heat.

Autoclaved yeast had no effect on weight restoration, showing this also not a property of B<sub>2</sub>. The authors have been unable to show the need for vitamin B<sub>3</sub> in rats but an experiment with Rhode Island Red chicks indicated in these birds that B<sub>3</sub> is an essential for growth. In this experiment autoclaved feed, with B<sub>1</sub> and B<sub>2</sub> supplements, did not restore growth although protecting from polyneuritis.—Walter H. Eddy, Samuel Gurin, and John Keresztesy, *J. Biol. Chem.*, 87: 729 (July), 1930.

**Vitamin G in Certain Meats and Meat By-Products**—Vitamin G (B<sub>2</sub>) is reported as occurring in varying amount in beef and beef liver and the

authors have previously found in commercial beef extract a good source of this vitamin. In this experiment rats were fed a ration containing corn extract for the vitamin B<sub>1</sub> but lacking G (or B<sub>2</sub>) until growth ceased, when the meat and meat by-products were added. These were trimmed free from fat and connecting tissue and dried at 60° C. with forced draft and where fat was present extracted with ether.

Supplementary material included beef (round steak), pork tenderloin, smoked ham, lamb, beef liver, pork liver, beef kidney, and beef spleen. Twenty-five per cent of the basal ration in beef furnished sufficient vitamin G for good growth. Pork tenderloin and smoked ham compared favorably with beef; 15 per cent of the former and 20 per cent of the latter resulted in excellent growth. Fifteen per cent of lamb was adequate for good growth. Fifteen per cent of spleen supplied sufficient vitamin G for good growth.

Both beef and pork liver and beef kidney are much richer in vitamin G than lean meat. Good to excellent growth resulted from 1.38 to 3.05 per cent additions of these products. All comparisons were made on the basis of air-dried fat-free material.—Ralph Hoagland and George G. Snider, *J. Agri. Res.*, 41: 205 (Aug. 1), 1930.

**A Method of Purification of Carotene and the Vitamin Activity of Purified Carotene**—Many recent investigations in the literature on the activity of carotene prepared from leaves or carrots indicate that the substance was not especially purified although Drummond has claimed that purified

carotene, melting point  $185^{\circ}$ , possesses no vitamin activity, contrary to the views of von Euler and Karrer.

Attempts were made to purify carotene without altering its physiological properties and assuring a separation from the impurities which accompany this presumably inactive carotene. Carotene was prepared by solution in carbon disulfide, crystallization in boiling methanol in an atmosphere of nitrogen. There was obtained crystallized carotene from carrots, melting point  $170^{\circ}$  to  $173^{\circ}$ , and showing biological activity on rats in daily doses of 0.03 mg. Five additional purifications resulted in a product, melting point  $184^{\circ}$  to  $185^{\circ}$ , which the authors regard as a very high degree of purification.

This product was found active as to vitamin A; a dose of 0.06 mg. per day stopped the loss of weight, cured xerophthalmia, and resulted in increased growth, a daily gain of about 1 gm.; 0.045 mg. gave approximate results; 0.03 mg. stopped the loss in weight and cured xerophthalmia but the resumption of growth in the animals was not uniform. Some of them merely maintained their weight. This product, which is found to be physiologically active, had the same melting point as that reported by Drummond for carotene as inactive.—M. Javillier and L. Emerique, *Compt. rend. Acad. d. sc.*, 191: 226 (July 28), 1930.

**Bacterial Spoilage of a Thousand Island Dressing**—The spoiled dressing which was studied was composed of a mayonnaise base made from corn oil, vinegar, egg yolk, sugar, paprika, mustard and pepper to which were added pickles, olives, and chili sauce. The pH of the product was between 4.2 and 4.4.

The spoiled material was darker in color and showed separation of oil in varying degree. Spoilage was found to be due to growth in the dressing of a pure culture of an organism closely resembling *B. vulgatus* (Trevisan).

After examination of the chili sauce and egg material used showed that these ingredients were not the source of the contamination, attention was given to the salt, sugar, vinegar, mustard, pepper and paprika. Organisms identical with that causing the spoilage of the dressing were isolated from the pepper and paprika. The mustard also contained a closely related species of spore forming organism. The other ingredients contained no bacteria similar to *B. vulgatus*. It is suggested that this type of spoilage may be prevented by: (a) preparing a product of such acidity that it will not allow the growth of organisms, or (b) sterilization of the ingredient which contains the contaminating organism.—Carl S. Pederson, *J. Bact.*, 20: 99 (Aug.), 1930.

**Nutritional Potency of Fresh, Cooked, Dry and Alcohol-Extracted Liver**—The literature has emphasized the importance from a nutritional standpoint of calf and cod livers; so experiments were undertaken to determine the nutritional value of other livers and whether this value would be retained on drying, so as to make a prospect for an available supply over long periods in view of the increasing cost of calf liver.

Livers were obtained from calf, steer, lamb, pig, hog, colt, horse, chicken, rat and cod; they were comminuted and dried at  $100^{\circ}$  C. and the dry material ground in a mill and placed in air-tight containers.

A synthetic diet was prepared essential in nutrients and mineral salts but lacking in the accessory vitamin factors. Rats lost 1 gm. per day on this synthetic ration and after 17 days supplements of the dried liver were fed for 10 days. The supplement was 4 gm., equivalent to 16 gm. of fresh liver. Rats on the synthetic ration alone and on this supplemented by raw beef liver served as controls. Growth curves show that in no case did dried liver addition result

in gains over the synthetic diet alone.

When the supplement was changed to raw liver and cooked liver rapid gain was made. Less rapid gains were made with alcohol extracted raw liver, showing that some accessory is lost in the extraction. Supplements of raw tomato and potato resulted in fair gains but no gain when these vegetables were cooked. Analyses of the livers of different animals show a number of variations. Copper in the calf, lamb and steer livers is approximately 10 times that in the hog, pig, horse, chicken, rat and cod. Iron in the colt, horse, pig and hog livers is approximately 3 times that in other domestic animals. The chicken liver has 4 times the amount of fat of any other liver. Apparently, calf, lamb, steer and chicken livers are on a par as to mineral and nitrogen and on this basis similar nutritional values might be expected to compare with calf liver.

This experiment indicates conclusively the loss of valuable accessories on heating and drying in air at 100° C.—J. S. McHargue, W. R. Roy, and F. E. Hull, *J. Nutrition*, 3: 49 (July), 1930.

**Vitamins in Canned Foods. IX. Tomato Products**—Various tomato products were fed to rats and guinea pigs to determine their potency in vitamins A, B, and C. The canned products used were whole tomatoes, cyclone juice heated to 140° F. under vacuum, similar juice concentrated to a pulp condition and further concentrated to paste, cyclone juice to which Celite was added and then filtered free of unsoluble pulp, plain cyclone juice held 1½ hours before canning, similar juice evaporated for 45 minutes in wooden tubs, cold tomato juice obtained during the peel-

ing process and juice obtained after steaming the tomatoes.

If the various products are fed on equivalent solid levels their vitamin A potency is approximately similar with the exception of the cyclone juice to which Celite was added and which was then filtered. The vitamin A is removed with the pulp by filtering. The vitamin B content of tomatoes is somewhat affected by certain processes wherein excessive exposure to oxygen occurs. Filtering with Celite reduced the vitamin B potency of the tomato juice by about two-thirds. Vitamin C in tomatoes is apparently quite stable to heat if oxidation is avoided.

In none of the products studied was the vitamin C conserved as in the regularly sound whole tomatoes. In concentrated products such as pulp and paste there was some loss of vitamin C. This was not due to concentration but was brought about before evaporation due to oxidation because of air entrapped in the juice during its passage through the cyclone. Concentration under vacuum corrects this condition and prevents further loss.

Rapidly heating cyclone juice to boiling and concentrating to two-fifths of its volume in an open kettle by boiling for 45 minutes does not permit the entrapped air to exert a destruction of half the vitamin C. Damaging air will not be beaten into tomato juice if cycloning is done while the juice is hot.

Data are given to show how steam may be employed to avoid contact with air in a manner which may have wide application in the handling of foods.—E. F. Kohman, W. H. Eddy, and C. Zall, *J. Ind. & Eng. Chem.*, 22: 1015 (Sept.), 1930.

# PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.\*

Well Guided Experience Is One of the Prime Requisites for Progress in the Public Health Nursing Profession—Probably every public health nursing executive, and certainly every state director of public health nursing, finds that she is now and then consulted by a staff nurse or a nurse out in the field as to how she can rise a step higher in her profession. Some of these nurses consulting her have stayed in one position for years, perhaps with a little increase in salary each year, or they have shifted from one school nursing or one county nursing position to another. They feel that that they ought to grow, to advance, to take added responsibility. We need many of these nurses who are content to stay on and do the great bulk of public health nursing; yet there are others who are unhappy and not doing their best work standing on a level year after year. They are ambitious and usually have vision and executive ability; our leaders in public health nursing must be recruited from these.

What advice do we give them? If they want to be the executive directors of public health nursing associations, no better advice can be given than that embodied in *The Board Members' Manual*:

The generally accepted standard for large associations is that she should be a high school graduate, a registered nurse graduated from an accredited school of nursing, preferably have had postgraduate work in public health nursing at some accredited college, experience as staff member of a public health nursing organization giving adequate supervision, experience as a supervisor, and, when possible, as an

assistant executive director. She should have sound administrative ability to organize and direct the work.

That nurse is lucky who during her nursing training had two or three months' field work with a good public health nursing organization, for this extra experience, though only giving her an inkling of what public health nursing is, enables her more easily to get a staff position with the organization after finishing training, provided her record is good and her personality suitable. Then after she has completed one, two, or three years of staff work, what if she wishes to go into another phase of public health nursing? The next step is to take one of the accredited university courses in public health nursing for 4 months—or better, 8 months. This will broaden her outlook on all phases of public health nursing, and she is then able to take a public health nursing position alone. If she makes good in a position by herself with her staff training and theoretical course behind her, she is in line for a position of greater responsibility, and can then begin to climb.

But what of the nurse who, after finishing nursing school, went directly into a public health position where she worked alone without training or supervised experience? If she finds she has advanced as far as she can, the only thing for her to do is either to get a position on a good public health nursing staff which has a good staff education program or take a university public health nursing course, and it is better to do both if her goal is to be an executive in a generalized, or even a specialized, public health nursing program.

For instance, a nurse who had been

\* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

doing school nursing by herself in a small town 6 years, with courses in university during 3 summers, is now on a well organized visiting nurse association staff where her promotion will undoubtedly be rapid. Another, a staff nurse for a good public health nursing association for 6 years, and wishing to get a county nursing position, will take a 4 months' university course before she is recommended for a county position.

But what of the great number of nurses who are just out of training school or who have been doing private duty and who never had any public health nursing during training or after? Since some of the university courses only accept students who have had some public health nursing training, they are cut off there. Their only hope is to get a staff position first and then take their university course; and there are not staff positions enough to go around. But for these nurses to go out and take public health nursing positions, even if organizations would employ them, is an injustice to themselves and to the communities.

It would seem that in order to train public health nurses better there needs to be more staff positions open to them. And this would be possible if more official agencies would employ real public health nurses as their supervisors or executive directors, so there could be a staff education program. The nurses on some official staffs are getting unguided experience. A physician or health officer cannot train nurses in their work; otherwise, why are physicians not superintendents and supervisors of nursing schools? There are some official agencies in the country, both city and county, which do employ well trained nurses as their directors, and they are accomplishing the outstanding work that is being done.

But what if a nurse has had all the experience and training that are necessary to direct a public health nursing

staff, either small or large, and she does not advance or get anything like the kind of position she wants? Then she had better study herself and see if her personality stands in her way—for as Malinde I. Havey, R.N., of the American Red Cross said after a study of nursing qualifications for rural nursing, "A course will do without experience; good experience will do without a course. But of the three things, theory, practice, personality, the greatest of these is personality."

**New School of Nursing at Vanderbilt University**—The School of Nursing at Vanderbilt University at Nashville, Tenn., has been organized as an independent school of university rank through the financial support of the Rockefeller Foundation. The school will offer not only programs of study to undergraduate students, but to graduate nurses as well.

Shirley C. Titus is Professor of Nursing Education and Dean of the School of Nursing at Vanderbilt University. Miss Titus is well known in the nursing field of this country. She holds a B.S. from Teachers College, Columbia University, and an M.A. from the University of Michigan.

Beginning September, 1930, courses will be offered to graduate nurses in public health nursing. The public health nurse may matriculate for a 4-year course leading to a B.S. degree; she may register for the 9 months' course, the satisfactory completion of which entitles her to a certificate in public health nursing; or she may take the 6 weeks' extension course which will be offered each summer (on or about June 12).

Mary J. Dunn is Professor of Public Health Nursing in this new school and will organize and direct the courses in public health nursing. Miss Dunn holds a B.S. from Teachers' College, Columbia University, and has had a varied experience as assistant consultant in

maternity, infancy and child hygiene with the New York State Department of Health—later with Cornell University as instructor in child care and training. For the past two years she has been educational director of the Bureau of Nursing, New York City Department of Health, and part-time instructor at Columbia University.

With its own dean, faculty and budget the Vanderbilt School of Nursing represents one of the most complete teaching centers for nursing education in the United States.—From announcement sent by Vanderbilt University to the A. P. H. A.

**The Nurse the Doctor Wants—**  
The ideal nurse for the present-day physician is one who has good breeding and an attractive personality, skill in giving general care and making patients comfortable, who can observe and report symptoms well, takes care to follow medical orders and is adept at handling people.

This picture of the perfect nurse was ascertained from questionnaires sent to doctors in many branches of medicine, by the Committee on the Grading of Nursing Schools, which is conducting a 5-year study of nursing and its problems. The above qualifications were the five most stressed by the more than 4,000 physicians from all parts of the country who answered the queries.

Just how the various requirements for a good nurse rank in the minds of the physicians as a whole may be seen from the following:

Requirements	Per cent
Skill in general care	65
Skill in making the patient comfortable	65
Skill in observing and reporting symptoms	45
Care in following medical orders	43
Good breeding and attractive personality	34
Skill in handling people	30
Skill in asepsis	28
Familiarity with hospital routine	27
Experience and background	22
Familiarity with their personal methods	21

Ability to work under a heavy strain	15
Familiarity with a particular disease	15
Responsible adult to take charge of the family	3
Mother's helper and houseworker	3

The modern physician thus places the old-fashioned concept of a nurse as "a pair of hands and feet" at the bottom of the list. His demand now is for a woman of good background, of high professional principles, with thorough training and experience in the actual care of the patient, as nurse for his cases.

The study shows that the demand for practical nurses by physicians is steadily dropping, with 84 per cent preferring the graduate, registered, trained nurse at all times for their own cases, and an additional 8 per cent preferring them always for certain types of cases.

The general practitioner and the internist are most interested in the ability of the nurse to give general care, 69 per cent and 70 per cent, respectively, registering for this quality, as compared with the average percentage of 65. The neurologist is least interested in it, though more than half of those questioned checked for it.

Skill in observing symptoms is most desired from the nurse by the surgeon, neurologist, obstetrician and pediatrician. The three last-named groups also had a more than average interest in the qualification of good breeding and personality. The surgeons emphasized skill in asepsis and care in following medical orders as well.

The neurologists are by far the most interested in having for their patients nurses who can handle people, 61 per cent checking this, as compared with an average of 30 per cent.

Nurses who take particular care to follow orders shine brightest in the eyes of the pediatricians, 57 per cent of them desiring this qualification, while the average demand is 43 per cent. The surgeons and the obstetricians are most interested in having nurses familiar with



hospital routine and their personal methods.

Nine out of 10 physicians reported they are getting the nurses they want and would be glad to take the nurse on their last case back again. The surgeons were the group most satisfied, 63 per cent of them marking their nurses with the highest rating.

Some of the typical comments made by the physicians, that show what they appreciate in nursing care specifically, were:

A good observer, gentle, thorough. She follows orders explicitly and reports changes promptly.

My nurse has a sense of humor, which helps a lot.

She kept hordes of anxious relatives and friends out of the room.

She has always been cheerful.

She combined a good technical training with common sense.

She carried out orders but modified them when the need was obvious.

She had a proper sense of the dignity of the position.

She is intelligent, observing, not afraid to take a severe case twelve miles in the country.

She was a good cook and knew how to handle people.

There has been a very distinct improvement in the patient's mental condition during her stay in the hospital.

Her asepsis was perfect.

She was of great value in preventing a psychosis from developing.

One of the nurses was exceptionally good-natured and tolerant.

Anyone who can feed a patient a half-pound of cooked liver daily for 4 or 5 months deserves credit for being a good cook and knowing how to handle people.

She sees to it that even the family are happy.—

*Nurses, Patients and Pocket-books*, 1928, p. 121; *Nurses: Production, Education, Distribution, and Pay*, May, 1930, 36 pp. Bull. Committee on the Grading of Nursing Schools, 370 Seventh Avenue, New York, N. Y.

## EDUCATION AND PUBLICITY

EVART G. ROUTZAHN\*

We Are Being Studied and Written Up—1930 will be notable for special recognition of health education by research workers and writers of reference works. An extensive study of health education in a large city has been published. A book manuscript reporting on health education through a period of years in a city is under consideration. Health education, both popular and in the schools, will be reviewed in the *Social Work Year Book* about to be issued by the Russell Sage Foundation. An encyclopedia article on popular health education is in manuscript form.

A study of education in mental hygiene has just been completed. Another study in the mental hygiene field has been announced. A careful review of social hygiene educational material recently made has been utilized in the planning of several experimental campaigns. A university thesis has been based upon an examination of public health in newspapers. A study of health education results in a county has included an examination of the newspapers upon which a university thesis will be built. The city health surveys have included small chapters on health education. And of course 1930 has seen much and varied study and formal discussion of the teaching of health in schools and colleges.

\* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

**We Thank the Guest Editor—**If in the fall rush you missed this department in the September and October issues of the JOURNAL, look them up and you will know why we thank Dr. H. E. Kleinschmidt of the National Tuberculosis Association.

#### **Syndicated Health Information—**

The "Annual Directory of Features" shows that "health advice columns were never more abundant." Twenty columns are listed by *Editor and Publisher* (Times Bldg., New York Aug. 30, 1930), the authors including Drs. Morris Fishbein, G. Logan Clendenning, William Brady, George C. Tallerday, Sophia Brunson, Royal S. Copeland, W. A. Evans, Iago Galdston, Frank McCoy, Joseph Jastrow, James W. Barton, John Joseph Gaines, Clarence W. Lieb, Leland B. Alford, and G. Leroy Dale. In contrast it is interesting to note that 109 sport page features are distributed. The directory includes lists of writers and artists, feature and picture syndicates, news, photographic, mat and art services.

**"Unfortunate Advertising"**—A warning from a professional journal seems to set a standard for all publications of all types in the public health field—and for the more or less educational printed matter from commercial sources so frequently distributed by health agencies:

Complaints are beginning to be heard regarding the advertising policy of some of our professional journals. There is a growing feeling that some of the advertising is detrimental to the best interests of the profession, and serves to hinder the proper development of . . . by placing around unworthy and unscientific preparations an aura of respectability that they by no means deserve. Forward-looking practitioners appreciate that honest and well directed advertising is a valuable means of informing the profession of products worthy of their attention. But they also are aware that intrinsically dishonest advertising, either by advertising scientifically worthless

preparations or by misstatement of fact, is a perversion of editorial license, and a disgrace to any profession which tolerates it.

There is enough information available, both scientific and regulatory, to make possible an honest and judicious selection of products for advertisement and the statements contained therein. The situation might be excused if there were no such information but since the publication of the exposes from the . . . conscientious practitioners may well question the motives and policies of those who carry such advertising. . . . In the long run, if any journal expects the support of the profession, it must prove its good faith by accepting only advertising that is honest.

#### **DIPHTHERIA**

A good 4-page folder to follow up a diphtheria campaign—Westchester Tuberculosis and Public Health Association, 8 Church Street, White Plains, N. Y. 2 cents.

The Board of Health, Racine, Wis., supplies a blue button with white letters reading: "I am Schicked—Are You?" Sample, 5 cents.

Buffalo department stores are using a 2-page leaflet, reproduced in *Health News*, State Department of Health, Albany, N. Y. June 23, 1930. Free.

"The Battle Against Diphtheria—News from the Front Line Trenches." *Public Health Nurse*. June, 1930. Reports from Bakersfield, Detroit, and elsewhere.

#### **HONORABLE MENTION**

To State of Ohio Department of Education: for bibliography in Health Education in Health and Physical Education Series—for dating most of the titles listed; names of publishers (and addresses of some of them); and prices of most pamphlets listed.

To Board of Health, East Orange, N. J.; Department of Health, Montclair, N. J.; Department of Health, Syracuse, N. Y.; Bureau of Public Health, New Mexico: for annual reports, all different, but all good—in the clear grouping of information, use of diagrams, table contents, and index (in two of them).

## RADIO

Health broadcast number 370 was released Sept. 15, 1930, by the U. S. Public Health Service.

Mimeographed copies of radio talks by New York City Department of Health are available. *Free*.

Reports of radio addresses over WCCO are reported in the issues of *Everybody's Health*, St. Paul, Minn. 10 cents.

Mimeographed copies of five radio talks given over WEEI are supplied by Massachusetts Society for Mental Hygiene, 5 Joy St., Boston, Mass. *Free*.

The Connecticut State Department of Health has announced topics for 5-minute talks every Thursday, September through May, over WTAC. List *free*.

Printed copies are available of broadcasts by the National Safety Council, 20 North Wacker Drive, Chicago, Ill. *Free*. Given Friday evenings over 23 associated NBC stations.

Thursday, September 25, 1930, the New York State Department of Health broadcast its radio health talk number 4321. Every Thursday from station WGY. The new releases on these radio talks show that nearly always the speakers cut out the opening generalizations and get down to business with the first sentence—due largely to the 5-minute limit.

## MOTION PICTURES

For the cost of the negative, a college, school or local amateur movie club will produce a picture portraying health facts, ideas, or activities.

Camp Sanitation, "produced in collaboration with the Indiana State Board of Health," is offered by National Motion Pictures Co., Indianapolis. 1,000 feet.

A one-reel educational motion picture, showing sanitation in camps and rural districts where modern sanitary features are not always obtainable.

New Methods of Malaria Control,

"produced in collaboration with the U. S. Public Health Service, and under the supervision of J. A. LePrince and H. A. Johnson," is offered by Universal Cinema Co., Indianapolis, Ind. 1,000 feet. Both 35 mm. and 16 mm. film.

This film is crowded with workable methods so convincingly simple that these can be readily patterned after. Besides this, the appeal of this film is of such human interest and force that the public will rally to the cause and cooperate with the public health officers in their mosquito eradication work.

The 1930-1931 edition of Selected Motion Pictures lists 34 titles under "Safety, Sanitation, First Aid and Health." Pictures supplied free. Motion Picture Bureau, National Council, Y. M. C. A., 120 West 41st St., New York, N. Y. *Free*.

"Films in Teaching Anatomy," by H. W. MacMillan, D.D.S. *Movie Makers*, 105 West 40th St., New York, N. Y. Oct., 1930. 25 cents.

"How Animated Cartoons Are Made," by Quinn Martin. *N. Y. World Magazine*. Sept. 29, 1930.

"Nut Crackers," by D. C. McGiehan. *Movie Makers*. Oct., 1930. "Home made helps for ambitious amateurs." Also, "Let's Make a Title Board!" by I. H. Smith.

"The Movies in Medicine," by Carl D. Clarke. *Hygeia*. Sept., 1930.

## DIPHTHERIA

A bull's eye diagram with 64 named dots represents the status of T. A. T. immunization of children under 5 years of age in as many communities in New York State. The idea could be applied to townships in a county or to wards in a city. In *Health News*, New York State Dept. of Health. Aug. 11, 1930.

A house-to-house canvass by nurses to interest parents in having their children immunized is described in *Weekly Health Review*, Dept. of Health, Detroit, Mich. Sept. 6, Sept. 20, 1930.

Governor Larson has been asked by

the New Jersey Committee for the Prevention of Diphtheria to grant it an honorable discharge. The committee feels that its work has been completed and suggests that further conduct of the campaign against diphtheria be carried on by the medical profession, health departments, and local groups organized by the state committee since it was appointed by Governor Moore three years ago.

#### EDUCATIONAL MATERIAL

Catalogue of Bureau of Dental Health Education, American Dental Assn., 58 East Washington St., Chicago, Ill. July 15, 1930. All forms of educational material. *Free*. Get copies for local groups interested in mouth hygiene. Thus you may help along with little effort and expense.

"Check List of Red Cross Publications." *Red Cross Courier*, Washington, D. C. Sept 2, 1930. *Free*. Some are useful to other agencies.

Public Health Service Publications. In *Public Health Reports*, Washington, D. C. Aug. 29, 1930. Titles issued 1929-1930—both popular and professional. Supt. of Documents, Washington, D. C. 5 cents.

Dr. Gerald B. Webb, Colorado Springs, Colo., is writing a pamphlet on "What You Should Know About Tuberculosis" for the National Tuberculosis Association.

The Care of Your Baby, by U. S. Public Health Service. Supt. of Documents, Washington, D. C. 50 pp. 10 cents.

Milk, by Agriculture Dept., Washington, D. C. 8 pp. 5 cents. Sanitation in production.

Social Hygiene in Relation to Prevention of Blindness, National Society for the Prevention of Blindness. 370 Seventh Ave., New York, N. Y. 32 pp. 25 cents. Get copies for editorial writers, and a few key individuals.

Watch Your Step! (feet); Attention!

Stand Tall! (posture); Care of the Child in Hot Weather; Supplies Necessary at Time of Confinement; Sensible Sun Baths. Massachusetts Dept. of Health. Samples *free*. Note how effective simple text and illustrations can be, and learn from your printer how antique paper would add but little to the cost with considerable gain in attractiveness.

The Home That is Safe (12 pp.); Helpful Suggestions About Infant Paralysis (4 pp.); Give Your Heart a Chance (12 pp.); What is Rheumatism? (12 pp.). Metropolitan Life Insurance Co., 1 Madison Ave., New York, N. Y. *Free*.

Catalogue of Free Publications. Evaporated Milk Assn., 203 North Wabash Ave., Chicago, Ill. *Free*.

List of Free Publications. California Fruit Growers' Exchange, Los Angeles, Calif. *Free*.

#### NEW

*The Journal of Cancer Research* has become *The American Journal of Cancer*, 1145 Amsterdam Ave., New York, N. Y., with a broadening of its editorial range.

#### MAGAZINE ARTICLES

These articles contain much quotable material for writing and speaking. They reveal health teaching which reaches large numbers of readers. Sometimes they will suggest friendly letters of correction to editors.

As a rule we do not list articles in *Hygeia*, *The Survey*, or in professional magazines which are available to all public health workers.

"Are you a Heliophobe?" *Literary Digest*. Aug. 2, 1930. Page 26.

"Can We Extend the Life Span?" by Louis I. Dublin. *Harpers*. May, 1930. Page 766.

"Don't Blame the Stork," by Ruth F. Wadsworth, M.D. *Colliers*. Aug. 23, 1930. Sex-determination.

"Fewer Die; Fewer Born." *Literary Digest*. July 19, 1930. Page 12.

"Infantile Paralysis," by George Draper, M.D. *Harpers*. Feb., 1930.

"Let Your Doctor Do It!" by Logan Clendenning, M.D. *Colliers*. Aug 2, 1930. The "specialist" in "general practice."

"New Wasp to Fight Mosquitoes." *Literary Digest*. July 19, 1930. Page 27.

"Rat Pie," by C. C. Van Blarcom. *Harpers*. Feb., 1930.

"Some Classic Allusions to Milk," by James A. Tobey, Dr.P.H. *Trained Nurse*. Sept., 1930.

"The Acid Test," by Fassett Edwards, M.D. *Colliers*. July 19, 1930. To be "acid" or not to be.

"The Job and the Life Span," by Louis I. Dublin. *Harpers*. Jan., 1930.

"Vineland Experiments Aid to Science." *Trenton Sunday Times-Advertiser*. June 29, 1930. Illustrated page; training of mentally handicapped.

"Why Drown?" by Capt. Charles B. Scully. *Saturday Evening Post*. July 12, 1930.

#### CAMPAIGNS—DAYS

March 1, 1931, is the final date for reports on the 1930 Health Conservation Contest conducted by the Chamber of Commerce of the United States.

A colorful parade was the feature of a preschool celebration of Child Health Day at St. Joseph, Mo., as described and illustrated in *Red Cross Courier*, Washington, D. C., Aug. 1, 1930. *Free*.

Two features of the coming Christmas Seal Campaign will be a playlet by Mrs. Louise Brand of the Wisconsin Anti-Tuberculosis Association, and a Sam Lloyd puzzle contest to be put on by state and local committees.

In the National Negro Health Week the prize for the best observance in a city of more than 100,000 was awarded to Nashville, Tenn., which city won also the prize for the best observance in

all communities. Wichita Falls, Tex., won in the class under 100,000 population, and Kent County, Md., reported the best rural observance of the week.

A report on the Early Diagnosis Campaign of the tuberculosis associations shows that 4,531,432 booklets and 907,660 posters and posterettes produced by the National Tuberculosis Association were distributed, in addition to small quantities prepared by some of the state associations.

The coöperation of the newspapers, radio broadcasting stations, magazines, and life insurance companies was superb. While there is no way of checking the total national publicity, it is fair to say that it exceeded that of all previous years. Of the plate matter and special stories sent out, newspaper clippings indicate a wide use.

#### WHY DO THEY DO IT?

A state health department mimeographed bulletin comes rolled. With some effort one can unroll the darn thing—but it is a sight!

#### REPORTING

The Organization of a Rural Tuberculosis Service, by Stephen A. Douglass, M.D., is another of the delightfully printed, paper cover reports issued by the Milbank Memorial Fund, New York, N. Y. A distinctive feature of this report is the group of full page photographs without any distracting captions or titles. Curiously enough the addresses of the health staffs of Cattaraugus County are not given.

The solid black cover of the 1928-1929 report of the Henry Street Visiting Nurse Service (99 Park Ave., New York, N. Y.) is broken by a cut-out in the center which corresponds to the silhouette of a nurse in the center of the title page. About  $5\frac{1}{2}'' \times 8''$ ; the Kabel Bold black-face type is striking for limited use; silhouettes on the 13 pages of text; 11 pages of easy-to-read financial statement, and management committees *with all names in caps and*

*lower-case.* The page "About Bequests" is unusually well done.

Says Maternity Center Association, 578 Madison Ave., New York, to its supporters:

As we are spending every available dollar on giving care to mothers in these hard times of unemployment, we are sending you this brief (and very inexpensive) account of our work for the year 1929 in lieu of our usual Annual Report.

The report is  $5\frac{1}{4}'' \times 4''$ , 12 pages, and accompanied by a large sheet listing names of contributors. *Free.*

Statistical Reports of Services, Bellevue-Yorkville Health Demonstration, 325 East 38th St., New York, N. Y. Again they illustrate how neatly and readably mimeographing and other processes can be used in presenting statistical data.

#### WRITE YOUR OWN HEADING

A way to make plain diagrams more picturesque is illustrated in "Underweight Children in Seattle," by W. W. Davis. *Hygeia*. Oct., 1930, pp. 937-940.

A topographic map of San Francisco is used to show location of playgrounds by the Playground Commission in its annual report. In contrast, on the opposite page is a street map of the city with its maze of streets and other fine detail. For some uses the topographic map brings a note of novelty and of clarity.

Recently *Editor and Publisher* offered the following "hunch" to newspaper editors:

How are babies marked for identification in the larger maternity hospitals of your city? How are the first 10 days spent in some of the leading institutions? A local story showing how the new babies arrive in the world in modern hospitals would be particularly timely and interesting.

A blotter appeal for a Henry Street Settlement camp (265 Henry Street, New York, N. Y.) makes an emotional appeal without "sobs." Four line cuts

show possibilities on a blotter. In adapting the blotter idea the cut-out flap could be omitted. Make the flap about two-thirds as large as the main blotter section, or merely double it. *Sample 2 cents.*

#### PLAYS

Mental hygiene was unusually and interestingly presented through a playlet entitled "My Son John" . . . at the annual convention of the National Congress of Parents and Teachers. The scenario was written by Dr. Lawrence Woolley, . . . and contained six scenes. The story revolved around 9-year-old Johnny whose family was disturbed by his frequent tantrums following an attack of illness and by his failing in school. A neighbor suggested that Johnny's mother seek the assistance of the local child guidance clinic, which she did. The subsequent scenes include the visit of the psychiatric social worker to Johnny's home; the psychiatric examination in the doctor's office; the customary staff conference on the case; and the psychiatrist's treatment interview with Johnny's mother.

. . . The audience was unanimous in expressing enthusiasm for this playlet as an educational medium of great value in getting across to that portion of the public which is uninformed about mental hygiene some of its essential features.

The playlet is being revised before publication by the National Committee for Mental Hygiene.

A Health play in which all the lines are chanted by the "Judge" offers a delightful and effective variation. "A Syncopated Health Trial," by Hazel M. Bowman. *Hygeia*. Oct., 1930, pp. 944-946.

#### PUBLICITY NEEDED

The responsibility in Cook County as elsewhere clearly rests in the first instance upon the citizens in whose neighborhoods these new centers of recreation (immoral road houses) are being located and no law enforcing officials, federal, state, or municipal, will be able to regulate or eliminate them without the *interested support of the public.*

—Cook County (*Illinois Roadhouses*, by J. F. Binford). *Journal of Social Hygiene*. May, 1930.

## SOCIAL HYGIENE

In "Gaining a Public" (*Journal of Social Hygiene*, May, 1930), Ray H. Everett tells of experiences in the "dark ages" of the social hygiene movement, and describes later developments. The newspaper situation is thus pictured:

Such writers as Dr. William Evans and Angelo Patri, whose material reaches national audiences through syndication, have rendered great service to the movement. In fact Dr. Evans probably was the pioneer in the use of the straight-forward medical terms, syphilis and gonorrhea, in his press columns. It was a curious anomaly that many newspapers carried venereal disease advertising but refused to mention these words in their news columns. Such advertising is prohibited by law in most states today, but many editors still ban such words as "syphilis," "gonorrhea," "prostitution" and the like, one even going so far as to attribute an address by a noted professor of urology to "a well-known professor of social diseases." There has been a noticeable increase both in liberality and understanding during the past few years, however, and the time may soon come when a great majority of editors will have no more fear of an adequate social hygiene vocabulary than have a constantly increasing number of their readers.

"Innocent Children," in the same magazine, reproduces a brief syndicated article by Angelo Patri which, appearing in a number of newspapers, brought 1,800 requests for social hygiene information.

Another article, "1850-1930," is an interesting historical review prepared for use in social hygiene programs in connection with the celebration of Dr. Welch's 80th birthday.

Under "Exhibits" is an account of the charts and other wall display material prepared for the annual meeting of the American Social Hygiene Association. We hope that the Association will adopt the suggestion that this material be mounted on a revolving or loose leaf

displayer where it can be shown to interested people who call at the national office. The type of material and the form of display would then illustrate a valuable idea for state and national health agencies, for reaching professional and volunteer workers who call at such offices in the course of the year. Probably it would be well to provide one or several high chairs to make the experience more comfortable.

## HOME-MADE POSTERS

A set of mimeographed health habit posters illustrates what might be done in many provinces and states. The mimeographed copies (on legal size sheets) may be colored, reproduced on the blackboard or on large cards or sheets, reproduced locally by mimeograph for wide distribution, or used to suggest posters to be made up from magazine pictures by the children. *Posters for Health Teaching—How to Make and Use Them* is a 2-page mimeograph memorandum. An example of sound advice:

If a single word or phrase is to be used, capitals are advisable, but for a sentence, use small letters. Allow space between words and lines.

All of the above from Health Education Service, Manitoba Department of Health and Public Welfare, Winnipeg. *Free.*

But why should not the above and other instructions on poster making include references to additional material available to the teacher, parent, or health worker who might care to get further ideas and help on the subject?

There are several books and several pamphlets on the subject—already mentioned in this department. Write if you wish them mentioned again.

## BOOKS AND REPORTS

**Tropical Medicine**—By *Sir Leonard Rogers and John W. D. Megaw.* Philadelphia: Blakiston's, 1930. 536 pp. Price, \$5.00.

Within the year we have had three notable books on tropical medicine, the classical works of Stitt and Manson being revisions. The book before us will unquestionably take a high place in such literature, giving, as it does, the experiences of two well known men as the result of years of experience in both clinical and pathological work in India. They hold that the existing books on tropical medicine are better fitted for readers who are trying to qualify for diplomas than practising physicians.

They have departed from the cut and dried method of arrangement, and have classified diseases in accordance with their causal agencies, believing that it is more suitable to discuss amebic dysentery, for example, as an intestinal infection than with other protozoal diseases like malaria. Following this plan, tropical diseases are grouped in 11 sections, with such headings as: "Febrile Diseases caused by Protozoa," "Febrile Diseases caused by Spirochaetes," etc. This classification has much to commend it. The authors evidently believe in the historical method of teaching, and give considerable space to the history of tropical medicine.

The book is well written and eminently practical, in descriptions of the diseases as well as treatment, though there will doubtless be those who will not agree entirely with some of the statements. It is interesting to note that the authors are not carried away with some of the newer drugs which have been widely exploited, such as plasmoquin in malaria, Bayer 205 in trypanoso-

miasis, and yatren for amebiasis. There are others who will possibly object to the retention of some of the older terms in classification.

Some of the illustrations are excellent, but others could be improved. On the whole, we consider the book one of the best in its class, and believe that it will fulfil its aim.

While the authors state that they have collaborated closely in the preparation, and each assumes a general responsibility for its contents, they have signed the chapters of which they are the authors, and reserve the right to some differences of opinion, holding that tropical medicine has not yet reached a stage which permits ex cathedra pronouncements or claims to infallibility.

M. P. RAVENEL

**Report on Fifth International Congress of Military Medicine and Pharmacy**—By *W. S. Bainbridge, Commander M.C.F., U. S. Naval Reserve. Menasha, Wis.: George Banta Publishing Company, 1929. 154 pp.*

The Fifth International Congress of Military Medicine and Pharmacy met in London in May, 1929. This congress is assembled bi-annually, usually in the capital of some one of the participating nations. Its mission is to afford an opportunity for the interchange of ideas, experience and knowledge in all branches of military medicine. The Fifth Congress was composed of delegates from forty nations.

The report as prepared by Commander Bainbridge, a delegate from the United States, is principally a compilation of reports and communications submitted to the Congress on the subjects of Evacuation of Sick and Wounded by



Air and Water: Tropical Fevers of Short Duration; Injuries to the Blood Vessels and their Sequelae; The Physical and Chemical Analysis of the Glass and Rubber Articles employed by the Medical Services, and The Standard of Dental and Physical Fitness in the Various Military Services. These articles are all the result of thorough study by men well acquainted with the subjects under consideration; consequently, they contain much information of value to those interested in military medicine and should prove of interest to all members of the medical profession. The article on the Evacuation of Sick and Wounded by Air and Water is particularly good.

The book contains a number of very interesting illustrations showing sanitary appliances and methods of transporting wounded men. In the preparation and publication of this concise yet comprehensive paper, Commander Bainbridge has performed a valuable service for the medical profession in general and for the military medical services in particular.

G. C. DUNHAM

**Proceedings of the Twelfth Texas Water Works Short School—Abilene, Texas, January 27-30, 1929.** 189 pp. Price, \$1.00.

This publication is divided into two sections, one on water and the other on sewage. In the first section a number of subjects such as improvements in particular water supply systems, cross-connections and their control and elimination, developments in the treatment of highly polluted water, swimming pools, underground water supplies, water purification by chemicals, and disinfection of drinking water are covered. A particularly interesting paper describing the water works of the City of Mexico by three of the engineers in that service is worthy of attention.

In "Progress in Sewage Disposal," Ehlers gives the status of municipal sanitary improvements in Texas on Jan-

uary 1, 1930. This is complete and valuable for reference. Other subjects touched upon by speakers include the effect of gases on bacteria growth in sewage, lagooning sewage sludge, observations on the treatment of cannery wastes, and the advantage of sludge circulation and vacuum degasification.

ARTHUR P. MILLER

**The Science of Biology—By George G. Scott, Ph.D. (rev. ed.)** New York: Thomas Crowell Co., 1930. 633 pp. Price, \$3.75.

Here is a revised edition which the publishers advertise as "practically a new book." However this may be, the arrangement of material and method of presentation are not materially changed. The writing of a textbook on biology in one volume is a stupendous task, and at best can be little more than an outline guide which the instructor fills in as his knowledge permits. Professor Scott presents an inclusive outline filled in with interesting and suggestive details. As to the pedagogical considerations involved one not concerned in this field should express no opinion. The sections on eugenics and eugenics from the standpoint of public health should be carefully read as indicative of what is being taught those who may become leaders in this field.

N. W. LARKUM

**Stalkers of Pestilence—The Story of Man's Ideas of Infection—By Wade W. Oliver, M.D. Introduction by Theobald Smith, M.D., Ph.D.** New York: Hoeber, 1930. Price, \$3.00.

Medical history has a peculiar fascination. It reveals the twists and turns of the human mind, many leading into darkness, but fortunately most having a general trend toward the light; also the pestilences which took an almost unbelievable toll of life and tried the souls of men. Not only has disease been a powerful factor in directing the growth of civilization, but has determined the

geographical distribution of races, and frequently changed the history of the world. Civilizations have disappeared before the ravages of pestilence, as in Italy and Greece. Vast areas of fertile soil have remained practically uninhabited and uncultivated on account of malaria, as in the southern states of our own country.

The book before us is a reprint with additions and corrections from *The American Journal of Surgery*. It is an outline rather than a history, though it covers an enormous amount of ground. A number of brief sketches of the great physicians of the past, but also some arrant quacks, are given, and there are some names one would not expect to find, like Sir Isaac Newton and Charles Darwin.

The book is well written, well documented, abundantly and well illustrated, and correct as to facts; but we consider the name misleading. The most notable omissions, considering the title, are of those who have stalked pestilences from the administrative standpoint, and one can hardly excuse the failure to maintain Villemin and his epochal studies on tuberculosis.

The book is a contribution to the study of medical history, which received its great impetus in this country from the late Sir William Osler, and can be commended as a handy reference.

M. P. RAVENEL

**Common Colds—Causes and Preventive Measures—By Leonard Hill and Mark Clement. London: William Heinemann, 1929. 121 pp. Price, \$3.00.**

While the preface does not so state, it is to be presumed from the arrangement of the subject matter that the book has been prepared for lay reading. The retention of rather obsolete terms such as "choane" and "conchæ" strikes the reviewer as unfortunate.

As a whole, the book presents in brief

but readable form a symposium on the effects of proper hygiene on the prevention of the common cold. One illustration is rather unhappily chosen in referring to the adaptation of dress to the requirements of climate and occupation by the statement that "women have, in recent years, shown how little is required," inasmuch as the young women in the United States most clearly represented by the above statement are the only ones, as a group, to show an increase instead of a decline in the death rate for pulmonary tuberculosis during the past decade.

The plea for better ventilation, more sunshine, reasonable dress, balanced diet, and adequate exercise as the most adequate measures against the common and infectious cold is, for the most part, clearly and logically presented.

ALBERT G. BOWER

**Ninth Annual Report of the Ohio Conference on Water Purification—Columbus, O. October 24–25, 1929. 107 pp.**

This pamphlet is so full of interesting and instructive material that a review of it can only indicate what it contains. The water purification and softening plants at Fremont and Marysville are described and discussed, and one paper is devoted to the subject of maintaining a chemical balance in purified water so as to eliminate its corrosive tendency.

The troublesome problem of phenol in raw water is touched upon in two papers, one of which discusses removal of phenolic tastes, and the other the control of such tastes by increased lime treatment. Similar to these there are two others, one of which covers the taste and odor problem at Toledo, and the other, which is particularly timely, covers the ammonia chlorine process as a means for preventing tastes and improving sterilization.

Due to the increased importance of swimming pools, two papers are devoted

to them, one on swimming pool sanitation and the other on design.

Several pages are devoted to miscellaneous plant problems.

ARTHUR P. MILLER

**Physiology and Biochemistry of Bacteria, Vol. II and Vol. III—By R. E. Buchanan and Ellis I. Fulmer. Baltimore: Williams and Wilkins, 1930. Vol. II, 709 pp. Price, \$7.50. Vol. III, 575 pp. Price, \$7.50.**

Volume I of this series appeared in 1928 and was reviewed in this JOURNAL January, 1929, p. 129. All that was said regarding Volume I applies to the other volumes. The authors have now completed the task they set out to accomplish, namely, the collection and evaluation of available information concerning the more fundamental properties of bacteria and the principles governing bacterial action. When one picks up Volume II with its more than 700 pages and reads in the preface that space limitations forbid elaboration in a treatise intended to serve merely as an *introduction* to the subject, one wonders how extensive a publication would be required to include the details which this volume introduces.

There is no question as to the value of these books as works of reference. The extensive bibliography alone is of exceeding worth, but however interestingly they may be written the number of readers is bound to be limited.

N. W. LARKUM

**Sleep. Why We Need It and How to Get It—By Donald A. Laird and Charles G. Muller. New York: John Day, 1930. 214 pp. Price, \$2.50.**

The presentation of the material recorded by these authors represents an interesting experiment in bringing the results of scientific experimentation before the general reader in such form that it challenges his interest. The sub-title and chapter headings use the terms of

our everyday language and are arranged in approved attention arresting phraseology. The short snappy sentences serve as excellent stimulation to counteract the soporific nature of the subject matter so that at no time is there any tendency for the attention to lag, and although not "primarily adventure or detective" cannot be used as suggested by its authors in the chapter, "When It's Hard to Get to Sleep."

The recommendations included in Part IV, based on the results of their scientific experiments, assume a form of expression calculated to arouse determination to follow them out to the letter. Anyone with an introspective or reflective turn of mind would find this fascinating reading, and one feels urged to recommend the whole book. The instructions for obtaining relaxation are found detailed and simple. One wonders if following them would be sufficient to bring about a degree of relaxation in those who really need it. To one who has never had any difficulty in getting to sleep, or in remaining asleep, the entire book sounds plausible and the instructions reasonable.

To one accustomed to reading descriptions of experiments in the classical form, with detailed description of apparatus and procedure, the book is likely to give the impression of being an interesting record of facts incompletely supported by experiments. This criticism has apparently been anticipated in the introduction. Unlike most books covering scientific subjects in a popular manner, the subject matter is so presented that one has the same stimulus and the same interest in knowing whether these experiments have been performed by others and the results confirmed or contradicted.

Although the experimenters seem to have provided for a percentage of error due to the human equation in the use of the special type of "guinea pig," one would like to know the results of others

in the same field. There is some adherence to the form of scientific presentation in that the work starts out with a review of theories held in the past, with references to literature and the description of typical experiments given in the appendix. The bibliography itself is of no small value.

While the book makes no claim to consideration as a medical treatise, one who is forced to think of it from that point of view is impressed by the lack of any reference to possible physical disorders as a cause of insomnia, and the importance of eliminating these, or of seeking appropriate medical attention before following the advice given.

One also wonders why anyone who appears to have had extensive training in the fields of biology, psychology and education, but without medical training, should be described as having engaged in "psychiatric testing," whatever that may be.

The book is published in convenient, attractive form and the type so arranged that it is pleasing and restful to the eye. It seems particularly timely, when communities are becoming aware of the tremendous amount of unnecessary noise.

HELEN P. LANGNER

#### The New Evolution, Zoogenesis—

By Austin H. Clark. Baltimore: Williams & Wilkins, 1930. 297 pp. Price, \$3.00.

In reviewing this book, one is confronted at the start with a controversial question. The question is not only controversial as to the actuality of evolution, but more especially as to the mode. Evolution at best is not accepted by millions of laymen, and to come forward with a "New Evolution" is likely to confuse rather than to clarify. Again, to advertise the book as being "As Epochal as Darwin" is to lend prestige indeed.

Despite the foregoing, the book is extremely interesting, and was written by

one of America's leading scientists. The point is made by some that the author's chief work has been among the crinoids, but we fail to see how this prevents him from being a good evolutionist. This reminds one of an occasion when one of our leading entomologists was visiting in Italy where he was introduced as "an American entomologist who knows something about biology." As if knowing something about biology were beyond the average entomologist! No special field of biology has a monopoly on knowledge of evolution, and as Dr. Clark's contributions have been in many corners of the biological world he cannot be charged with being a narrow specialist. From this broad touch he has brought a multitude of facts portrayed in such manner as to be easily understood by the average reader.

The outstanding point Dr. Clark makes is, in his own words: "Life in its very first beginnings developed at once and simultaneously from the primitive single cell in every possible direction, giving rise to some original form or forms in every phylum. So at its very first appearance animal life assumed essentially the same form as that in which we know it now so far as the phyla or major groups of animals are concerned" and "No matter how far back we go in the fossil record of previous animal life upon the earth, we find no trace of any animal forms which are intermediate between the various major groups. . . ."

If the absence of connectant forms in the geological record is a stumbling block, with reference to the affinities of the major groups, how does Dr. Clark relate the fishes, amphibians and reptiles with his "primitive single cell"? These three groups, to say nothing of many other higher vertebrate animals, do not extend back beyond the paleozoic, yet there is a vast expanse of time between the paleozoic and the time when life first arose.

It is a bit unfortunate to say "there

is not the slightest evidence that man is descended from an ape," because there is no real controversy here, but the lay reader would be justified in assuming that there is one. The present data as to man's zoölogical relationship have to do largely with certain fossil forms found in various parts of the earth. Among these are the "southern ape" of South Africa, the "Java ape-man," the Piltdown man of England, the Heidelberg man that comes from the second interglacial period, and the Neanderthal man of the third interglacial period, the last resembling man so closely that it is placed in the same genus under the name of *Homo neandertalensis*. With reference to this creature, Dr. A. S. Romer, of the University of Chicago, says: "He is a man, in the broad sense, but a man with the mark of the ape upon him." Romer believes that this Neanderthal man and our species had a common Asiatic (or African) ancestor. The point is, man *did* have an ancestor that was different from man's present state; so who cares whether he was an ape or a baboon?

Although this book is crowded with interesting facts, we suggest, for the lay reader, that it be preceded by some book written more from the standpoint of an introduction to the subject of evolution in its various forms. C. F. ADAMS

**The Principles and Practice of Hygiene**—By Dean Franklin Smiley, Adrian Gordon Gould and Elizabeth Melby. New York: Macmillan, 1930. 415 pp. Price, \$2.50.

Although not indicated in the title, the preface and the context make it clear that this book is intended chiefly for nurses. We agree entirely with the authors' statement concerning the importance of health instruction in the nursing curriculum. It is perfectly true that nurses have opportunities enjoyed by no other class, physicians not excepted, for teaching the principles of

hygiene and good living. The necessary exposure which every nurse must incur makes her own protection important, and this personal phase is emphasized. The authors also feel that the nurse should know how and what to teach for the foundation of health.

Looked at from the points of view enumerated, the book is adequate. In some respects it lacks balance. Immunity, including the various vaccines, is given only 14 pages, and this is all that is said about 11 diseases, including such important ones as diphtheria, scarlet fever, meningitis, smallpox, and measles. Less than two lines are given to rabies, and one would suppose from the statement that the vaccine was produced by growing the organisms at unfavorably high temperatures, or in weak antiseptic mediums. Since the curriculums of many schools of nursing are woefully deficient in time given to bacteriology and the methods of its presentation, we believe that this chapter is inadequate. Each chapter ends with a summary which we fear will conduce to laziness, since the student will read this only. However, it is a useful feature where rapid reference is desired.

The book is well printed and made up. The illustrations are sufficient and good. Altogether, the book can be thoroughly commended in its class.

M. P. RAVENEL

**Pioneers of Public Health. The Story of Some Benefactors of the Human Race**—By M. E. M. Walker. With Foreword by Sir Humphrey Rolleston. Edinburgh and London: Oliver and Boyd, 1930. 270 pp. Price, \$5.00.

A book of this type inevitably brings to mind the *Psalm of Life*. Biographies are always interesting and generally useful. The question of selection of subjects comes foremost. The scientists of whom the author writes were suggested by the fact that their names are in-

scribed on the walls of the new building of the London School of Hygiene and Tropical Medicine. Of 21 men, 12 are British, 4 from the United States, 3 from Central Europe, and 2 from France. There can be no fault found with the selections as far as they go, though one might well wish that other names had also been included.

The volume begins with Thomas Sydenham, "the English Hippocrates," and, as the author suggests, some might have preferred that it be headed by Hippocrates himself.

Due credit is given to the laymen, Chadwick in England, and Shattuck in America, who did so much to show the evil effects of poverty and poor health and the necessity of rational preventive medicine. We believe also that the author has done well to confine his list to those who have been dead long enough to allow a critical world to weigh justly their merits.

The weakest biographies in the book are those of the Americans. One would suppose, for example, that General Gorgas accepted the work of Reed at once, yet "his conversion was slow," and he did not begin anti-mosquito work until two months after General Wood's General Order No. 6, December 21, 1900. He persisted in the disinfection of beds, clothing, etc. until the middle of August, 1901, though orders had been issued by Colonel Havard, Chief Surgeon, in April, for its discontinuance. The first attempts at controlling yellow fever in Havana by cleaning the streets, patios and buildings were not successful, and after the thorough cleaning up, one of the most severe epidemics of recent years took place. Carlos Finlay had said that the work was along the wrong lines, and only measures against the mosquito would give the desired results. It took the epidemic to convince those in charge of the truth of this statement.

It is to be regretted that a book pub-

lished in 1930 should perpetuate the fallacy put forward by Noguchi in 1918, concerning the causative organism of the disease. In view of the work of the Commission on Yellow Fever under the auspices of the International Health Division of the Rockefeller Foundation, and others, there seems to be no excuse for this.

There are also a number of minor errors, particularly in the biographies of the Americans, in the spellings of names and positions occupied. The old term "stegomyia fasciata" is retained for the yellow fever mosquito.

The book is delightfully written. There is not a page that does not hold the attention. The illustrations are excellent and the printing and make-up of high quality. M. P. RAVENEL

**Elementary Materia Medica, Including Drugs and Solutions—By Walter W. Kruger, Ph.B. Philadelphia: Saunders, 1929. 278 pp. Price, \$1.75.**

Among the many elementary textbooks on the market, the one under review ranks with the best. The material treated, and the manner of its arrangement, constitute the development of a course given to nurses during the past six years.

In addition to a very proper historical and theoretical background, the practical application of all facts presented is held of first importance, and rightly so. It is one thing to know something about elementary materia medica and solutions; it is another one to be able to apply this information.

There are 20 chapters, an appendix and an index. Each chapter is concluded with a set of questions and a brief bibliography, while chapters 19 and 20 consist wholly of "Problems for Review" and "Laboratory Exercises and Demonstrations." The appendix is a "General Bibliography" of the more important works bearing on the subject.

The most usable chapters consider such subjects as pharmaceutical preparations, arithmetic review, weights and measures, solutions, preparation of solutions, antiseptics and disinfectants, doses and their preparation and the administration of medicines, although various other subjects are quite adequately treated.

The book is reasonably free from errors, fairly well illustrated and, upon the whole, a very useful publication on elementary *materia medica*.

C. F. ADAMS

#### The Human Factor in Industry—

By E. P. Cathcart, C.B.E., M.D., F.R.S. New York: Oxford University Press, 1928. 105 pp. Price, \$1.75.

The several chapters of this small book are based upon two series of lectures given in the Engineering Department of Glasgow University. "We are still far from the day envisaged by Butler in *Erewhon* when man will be reduced to the status of a mere 'machine-tickling aphid.' " Man must always be variable in every calculation involved in industrial production. He is not a machine but a sentient being.

The five chapters are devoted respectively to physiological considerations (in industrial relations), fatigue and monotony, alleviation of fatigue, environmental factors (in fatigue), and industrial personnel. There is also an Appendix upon "The Living Wage," and an appended Bibliography for each chapter. A great majority of the illustrative instances used in the text have been taken from the Reports of the Industrial Fatigue Research Board.

In the average workshop the hardest work is most often done by the worst paid worker whose mechanical efficiency cannot possibly exceed 20-25 per cent of his caloric intake. The pure brain worker apparently requires no additional intake to cover the expenditure

of mental energy. Man is really a "psychic chameleon," relatively few really thinking, and most taking their ideas second-handed. The complications of this situation are subjects of interesting physical and mental analysis.

Numerous short tables and diagrams serve to illustrate the economic side of human efficiency at work. At present, selection tests are often ludicrous: in the case of 6 managers interviewing 36 candidates for posts, 1 was rated as number 1 and 32, and another as 3 and 30, in their respective estimations. In short, important factors concerned with industrial fatigue and their practical solution in industry compose the theme of discussion throughout the book. There are many American as well as Continental citations of the author's theme and conclusions.

The book is a very readable and concise discussion, by a leading physiologist, to a non-medical audience, and is also valuable as a source book of recent facts, theories, and experiences.

EMERY R. HAYHURST

#### The Bacteriophage and Its Clinical Applications—By F. D. d'Herelle. Springfield, Ill.: Charles C. Thomas, 1930. Price, \$4.00.

Each chapter in this book corresponds to one of the Lane Lectures delivered at Stanford University, October, 1928. It is addressed especially to practitioners of medicine, and presents the perplexing problem of these intracellular particles.

The revolutionary views of the author can be seen from the following quotation (p. 6):

The cellular theory of life is manifestly false, for life is an attribute of intracellular particles. The antibodies play no part in the phenomena of recovery. The form and the properties of bacteria are inherently variable characters.

He presents the reasons for and against the living character of the bacteriophage corpuscle, holding that the

bacteriophage is a corpuscle (micellum) possessing autonomy; has its own characters which it transmits to its descendants, and is completely independent of the bacterium at the expense of which it multiplies. It possesses powers of adaptation. It secretes a lysin, and thus has the same agency for assimilation as other living beings. If adaptation, assimilation and multiplication define life, why, then, can it be maintained that the bacteriophage is not a living being? Philosophically, the author answers (p. 97):

We do not yet know what life is, that is to say, as yet we have not succeeded in identifying the physico-chemical property which confers upon the protoplasmic micella the faculty of assimilation.

The results thus far obtained with bacteriophage therapy in infections of the enteric tract and in those due to the organisms of the enteric group are summarized as: (1) specific for bacillary dysentery; (2) specific for Asiatic cholera; (3) of little value in the typhoid and paratyphoid fevers; (4) highly effective in acute colon; (5) promising in infantile diarrheal conditions and in enterocolitis; (6) upon the basis of a limited experience appears effective in sprue.

Three factors appear to play an important rôle in the effectiveness of bacteriophage treatment: virulence of the phage, mode of administration, and time of treatment. A disregard of these seems to account for at least some of the failures.

The action of the bacteriophage can be stated as resulting in: the dissolution of the bacteria; enhancement of opsonic power, a refractory state of more or less

duration in the host due to the bacterial proteins of the disintegrated bacteria. It induces modifications of the characters of bacteria, whenever it establishes symbiosis with a bacterium, though these seem to occur in an apparently irregular fashion. The author claims that bacterial mutations are produced exclusively through the action of the bacteriophage.

The author points out the importance of bacteriophagy to pathology, immunology, epidemiology and hygiene. Its study will not only force a new appraisal of theories, but will initiate research and hope in a cure for diseases, especially of the persistent chronic type, e.g., tuberculosis.

The reader who is interested in studying further the problems of bacteriophagy can find much more material in the detailed account by d'Herelle, *The Bacteriophage and its Behavior*. In it he will also find references to the work of the authors referred to in this book.

ESTHER W. STEARN

**Pettibones Physiological Chemistry**  
—By J. F. McClendon, Ph.D. St. Louis: Mosby, 1929. 368 pp. Price, \$3.75.

This fourth edition of Pettibones textbook has been developed from the course in physiological chemistry as given in the Medical School at the University of Minnesota. It is intended as an intermediate text covering both the theoretical and practical laboratory work in physiological chemistry, as taught at Minnesota, and has been revised and brought up to date by McClendon.

R. W. PRYER



# HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

**Syracuse, N. Y.**—A table of contents, an index, and numerous charts and graphs make easy the study of the annual report of the Department of Health for 1929. The estimated population of 201,645 establishes Syracuse as the fourth largest city in New York State, with a 1929 birth rate of 21.0 and a crude death rate of 13.0. The infant mortality rate of 55.7 and the tuberculosis death rate of 57.5 were the lowest ever attained in the city.

The Health Department appropriation for 1929 was \$293,000 (\$1.47 per capita), of which \$33,000 was received from the Milbank Memorial Fund. The diphtheria immunization campaign, begun in 1923, has resulted in protective treatments being given to 27,372 children. Only 19 deaths have occurred from diphtheria in the past 5 years.

New cases at the well baby clinics in 1928 were 1,125, with 6,854 clinic visits, more than one-half being brought to the clinic before the child was 3 months of age. The summer round-up of children expecting to enter school in September has necessitated the employment of additional physicians, making possible 9 preschool clinics a week.

**Chelsea, Mass.**—The 1929 annual report of the Board of Health of Chelsea is made up primarily of tabular material. Based on an estimated population of 47,247, a death rate of 11.72 per 1,000 living, exclusive of stillbirths, is recorded. Corrected for residence, the rate is lowered to 6.77.

During the year a milk regulation was passed requiring that all raw milk, offered for sale in the city, be from tuberculin tested and accredited herds, or tested herds on the way to accreditation under state and federal supervision; that

it be certified by a medical milk commission in a manner required by law; that when offered for sale it shall contain not more than 10,000 bacteria per c.c.; and that all milk not meeting these requirements be pasteurized.

Of 11,049 defects found in examining school children, 5,017 were corrected during the school year 1928-1929.

**Schenectady, N. Y.**—The health activities for the year ended October 31, 1929, are portrayed in a gray covered report of 45 pages. This city with an estimated population of 95,849 reports 140 more deaths during 1929 than in 1928, or an increase in the rate from 10.96 to 12.33 per 1,000. Heart disease and cancer, with increases of 32 and 18 respectively, accounted for one-third of this increase. Pneumonia followed with 29 deaths, influenza 21, tuberculosis 7, and automobile accidents 7. A birth rate of 17.52 per 1,000 and an infant mortality rate of 72 are recorded.

The supervisor of nurses, in her report to the health commissioner, states that for a long time there has been need for more nurses to do clinic work as well as work in the district, and that this need has been particularly urgent in the tuberculosis division.

The Committee on Tuberculosis and Public Health came to our aid and in July appointed a nurse to help reorganize this division. The old files were gone over and many old cases were again taken up. All cases that had been reported during the past 10 years were investigated and all contacts, especially children, were asked to have an examination, either by their own family physicians or at the health center. One of the real needs at present is a preventorium for children who are not in good physical condition and yet are not tuberculous.

A modern abattoir has been con-

structed during the year where animals may be slaughtered under more cleanly aseptic surroundings, and the meat carefully inspected, and stamped before being offered for sale to the public. A veterinarian has been added to the health department staff.

An increase is shown in the amount of milk sold daily in the city, approximately 4,500 quarts being consumed, more than one-half of which is delivered to homes. Eighteen hundred half-pints of milk are delivered daily to the schools in the city.

**Worcester, Mass.**—During 1929, Worcester showed considerable progress along health lines, according to the annual health department report. Sanitation has been improved since the completion of a new Decarie type plant for the incineration of rubbish. Finances have been appropriated for the purpose of adding a new wing containing 100 beds to the tuberculosis ward of Belmont Hospital. This addition will provide further accommodation for persons with incipient tuberculosis, and also will meet the requirements of the State Department of Health.

In general, the number of cases and deaths from communicable diseases has decreased. Diphtheria has dropped from 309 cases with 28 deaths in 1925 to 108 cases with 6 deaths in 1929, while scarlet fever has decreased from 631 cases with 16 deaths in 1924 to 311 cases with 2 deaths in 1929. The birth rate for the city during the year was 19.50, the death rate, corrected for residence, 10.08, and the infant mortality rate 61.55.

Preschool work, which includes the diphtheria immunization clinics and summer round-up clinics for children about to enter school in the fall, shows continued progress, as does the work with children of school age. An additional dental hygienist has been appointed, who will be available for class

instruction under the supervision of the dentists. Interspersed throughout this report are barred diagrams in black and white, which not only supplement the text, but add to the attractiveness of the report.

**Wood County, W. Va.**—The annual report of the Wood County, W. Va., Health Department is a concise, well assembled and very readable one of 16 pages. The department personnel consists of a health officer, 2 inspectors, bacteriologist, county health nurse, and clerk. The per capita cost of public health work is 24 cents.

Dairy herds are tuberculin tested once a year. All milk and milk utensil handlers are examined. Of the milk samples examined, 76 per cent gave counts less than 100,000 bacteria per c.c. Inspections of dairies and other food handling places totaled 592, other sanitary inspections totaling 585.

Immunization treatments against disease were as follows: anti-typhoid 700, antismallpox vaccinations 600, toxin-antitoxin 4,200, diphtheria antitoxin 17, antirabic 2. School examinations, made as often as possible, are somewhat limited because of severe weather and distance. The number of schools visited by the physician and nurse was 193, in which 3,496 pupils were inspected; 1,567 being examined by a physician. Examination results with accompanying suggestions are sent to the parents, personal contacts being impossible because of the lack of personnel. Of the 15,000 defects found, 750 were corrected.

Thirty preschool conferences were also held. At least one venereal disease clinic is held each week, the average attendance being 30.

**Marion County, Ore.**—The Marion County Health Unit has prepared an attractive 35 page report for 1929, which shows the organization to be com-

posed of a health unit committee of 8 members, a health officer and deputy, a school dentist, 8 staff nurses and 1 supervisor, milk and food inspector, sanitary inspector, and 2 office clerks. The total appropriation for health during the year 1930 was \$40,175, or \$.80 per capita. Local funds will total \$30,985, an increase of \$8,200 over 1929, while the remainder will be spent by the Commonwealth Fund.

The death rate for Marion County in 1929 was 13.1 per 1,000 population, the birth rate, 15.6. The 1929 infant mortality rate was 39.7 per 1,000 live births, as compared with 48.0 for the state of Oregon. The tuberculosis death rate for 1929 was 40.0 per 100,000 population. The county for the same year experienced no deaths from smallpox, 1 from diphtheria, 2 from measles, 1 from typhoid, and 382 from the so-called degenerative diseases. No deaths oc-

curred from scarlet fever. A special survey was made to locate tuberculosis cases and contacts, in which the physicians in the county coöperated in early reporting, and a weekly chest clinic has been effective.

With the passage of a suitable milk ordinance in 1928, considerable progress has been made toward enforcement and in assisting in improving milk quality. By January 1, 1930, 83 per cent of milk sold in Salem was pasteurized, and all raw milk showed a bacterial count of less than 50,000. Inspection of highway tourist camps is a sanitary task here as elsewhere. In addition to 32 such tourist camps, over 100 other temporary camps, maintained by berry and hop growers, required supervision. The A. P. H. A. appraisal score for Marion County for 1928 was 754 out of a possible 1,000, a gain of 49 points over 1927.

## BOOKS RECEIVED

TROPICAL MEDICINE. By Sir Leonard Rogers and John W. D. Megaw. Philadelphia: Blakiston, 1930. 536 pp. Price, \$5.00.

STALKERS OF PESTILENCE. THE STORY OF MAN'S IDEAS OF INFECTION. By Wade W. Oliver. New York: Hoeber, 1930. 251 pp. Price, \$3.00.

MENTAL HYGIENE. By Ernest R. Groves and Phyllis Blanchard. New York: Holt, 1930. 467 pp. Price, \$4.00.

A WORLD PANORAMA OF HEALTH EDUCATION. American Child Health Association and The Metropolitan Life Insurance Co. New York: 1930. 256 pp. Price, \$.50.

RIDERS OF THE PLAGUES. THE STORY OF THE CONQUEST OF DISEASE. By James A. Tobey. New York: Scribner, 1930. 348 pp. Price, \$3.50.

THE FIRST YEAR OF LIFE. By Charlotte Buhler. New York: John Day, 1930. 281 pp. Price, \$3.50.

CHILDREN OF THE COVERED WAGON. By Estella Ford Warner and Geddes Smith. New York: Commonwealth Fund Division of Publications, 1930. 123 pp. Price, \$1.00.

THE STATE HEALTH DEPARTMENTS OF MASSA-

CHUSETTS, MICHIGAN, AND OHIO. WITH A SUMMARY OF ACTIVITIES AND ACCOMPLISHMENTS: 1927-1928. By James Wallace. New York: Commonwealth Fund Division of Publications, 1930. 192 pp. Price, \$1.50.

STEDMAN'S MEDICAL DICTIONARY. (11th rev. ed.) By Thomas Lathrop Stedman. New York: Wood, 1930. 1222 pp. Price, \$7.50.

MOLDS, YEASTS, AND ACTINOMYCETES. A HANDBOOK FOR STUDENTS OF BACTERIOLOGY. By Arthur T. Henrici. New York: Wiley, 1930. 296 pp. Price, \$3.50.

TOBACCO. By Dr. Walter L. Mendenhall. Cambridge: Harvard University Press, 1930. 69 pp. Price, \$1.00.

HYGIENE. A COLLEGE TEXTBOOK FOR NON-MEDICAL STUDENTS. By R. C. Whitman. New York: Wiley, 1930. 327 pp. Price, \$2.50.

ARTIFICIAL SUNLIGHT, COMBINING RADIATION FOR HEALTH WITH LIGHT FOR VISION. By M. Luckiesh. New York: Van Nostrand, 1930. 254 pp. Price, \$3.75.

AN INTRODUCTION TO MALARIOLOGY. By Mark F. Boyd. Cambridge: Harvard University Press, 1930. 437 pp. Price, \$5.00.

# A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

**Enuresis Studies**—An exhaustive research in the psychiatric aspects of enuresis, dealing with age, sex, physical, pathologic and social factors as related to this condition.

ANDERSON, F. N. The Psychiatric Aspects of Enuresis. *Am. J. Dis. Child.*, 40, 3: 591 (Sept.), 1930.

**Maternal Hygiene Standards**—Excerpts from a committee report with the recommendations for prenatal care given in full.

ANON. Standards for Maternity Care. *Child Health Bull.*, 6, 5: 146 (Sept.), 1930.

**Psittacosis**—An excellent statement of what is known of the epidemiology, infectivity, diagnosis, prognosis and prevention of this unusual disease.

ARMSTRONG, C. Psittacosis: Epidemiological Considerations with Reference to the 1929-30 Outbreak in the United States.

**Dental Caries**—Diet including green vegetables, fruit and milk and low in sugar is inhibitive to dental caries. Is this the result of a decrease in aciduric bacteria in the mouth, the increase in salivary alkalis or the hardening of the teeth? The underlying theory is less important than the practice.

BUNTING, R. W., *et al.* The Problem of Dental Caries. *Am. J. Dis. Child.*, 40, 3: 536 (Sept.), 1930.

**Milk-Borne Epidemics**—Reporting the occurrence of milk-borne epidemics from 1924-1929, 44 new outbreaks are added to the 214 recorded in the previous 5 years; an unenviable record.

CRUMBINE, S. J. Milk-Borne Epidemic Diseases in the United States and Canada Reported by the State and Provincial Health Authorities, 1924 to 1929. *Child Health Bull.*, 6, 5: 157 (Sept.), 1930.

**Arthritis Symposium Continued**—The excellent symposium on arthritis (reported in the September Bibliography, q.v.) is extended to cover additional subjects in the diagnosis and treatment of this condition. Together, the two installments form a most inclusive and authoritative discussion of this important field of public hygiene.

CECIL, R. L., *et al.* Symposium on Arthritis—Continued. *J. Lab. & Clin. Med.*, 15, 12: 1177 (Sept.), 1930.

**Diphtheria Distribution**—Evidence is presented showing that variation in diphtheria prevalence is associated with dosage and host-resistance. Examples are also given in which the determining factor is obscure. An excellent dissertation.

DOULL, J. A.. Factors Influencing Selective Distribution in Diphtheria. *J. Prev. Med.*, 4, 5: 371 (Sept.), 1930.

**Effects of Tonsillectomy**—A 10-year follow-up study indicates that tonsillectomy reduces the chances of sore throat, scarlet fever, diphtheria and rheumatic fever, has no beneficial influence on the incidence of head colds, and that respiratory infections such as laryngitis, bronchitis and pneumonia occur more frequently in tonsillectomized children.

KAISER, A. D. Results of Tonsillectomy. *J. A. M. A.*, 94, 12: 837 (Sept. 20), 1930.

**Cancer of Lip and Tongue**—The author discards smoking as the cause of cancer about the mouth; she discounts the influence of syphilis; and leaves the jagged tooth theory suspended.

LANE-CLAYTON, J. E. Cancer of Lip, Tongue and Skin. Ministry of Health (British) Reports on Public Health and Medical Subjects, No. 59, 1930.

**School Health Programs**—An excellent picture of a unified health program including school sanitation, physical education, health instruction and health supervision at an estimated minimum cost of \$7 per child. The aims—less illness, greater efficiency and happiness.

KEENE, C. H. A Program for School Health. *Pub. Health Nurse*, 22, 9: 444 (Sept.), 1930.

**British Health Service Opportunities**—A frank statement of the possibilities for a career in the public health service precedes an outline of the educational requirement for the D. P. H. in Great Britain.

KERR, H. The Public Health Service as a Career. *Med. Off.*, 44, 10: 97 (Sept. 6), 1930.

**Mental Hygiene in Toronto**—How mental hygiene is incorporated in the work of the public health nurses of the Toronto Department of Public Health is well told in a paper discussing the broad issues of mental health.

LEWIS, E. P. Mental Health. *Pub. Health Nurse*, 22, 9: 458 (Sept.), 1930.

**Preventing Diphtheria in Lowell**—How 25,000 children in Lowell were immunized at an approximate cost of 7 cents per child is recorded in painstaking detail.

MCNAMARA, J. J., and SULLIVAN, G. M. Diphtheria Prevention in Lowell, 1928 and 1929. *New Eng. J. Med.*, 203, 9: 413 (Aug. 28), 1930.

**More About Rheumatism**—Still another symposium on rheumatic fever, this time a British discussion.

MILLER, S., *et al.* Rheumatism in its Public Health Aspects. *Pub. Health* 43, 12: 377 (Sept.), 1930.

**Dietary Facts and Fancies**—A useful review of dietary knowledge exposing the food faddists.

STONE, W. J. Dietary Facts, Fads and Fancies. *J. A. M. A.*, 95, 10: 709 (Sept. 6), 1930.

**Status of Scarlet Fever Prophylaxis**—Nothing new is reportable to change the attitude of the conference of state and territorial health officials expressed in 1926, to wit: the Dick test is a fairly dependable indication of the immunologic status; scarlatinal streptococcus toxin will immunize susceptible individuals; the value of antitoxin for passive immunization is not sufficiently proven.

VELDEE, M. V. The Present Status of Streptococcus Biologic Products in the Prevention and Treatment of Scarlet Fever. *Pub. Health Rep.*, 45, 32: 1827 (Aug. 8), 1930.

**Silver Polish Poisoning**—A number of cases of poisoning thought to be due to foods were later found due apparently to the use of tableware on which a cyanide silver polish had been used. This leads to the warning against the use of polishes containing this material.

WILLIAMS, H. Cyanide Poisoning, Acute and Non-Fatal, Apparently from Hotel Silver Polish. *J. A. M. A.*, 94, 9: 627 (Mar. 1), 1930.

**Cultural Characteristics of Diphtheria Bacilli**—"Smooth (colony) virulent, toxic diphtheria bacilli are transformed to non-virulent, 'R' (rough colony) forms in the throats of patients during convalescence." Vaccination of carriers of the smooth colony forms with an "S" vaccine is suggested.

YU, H. A Study on the Dissociation of the Diphtheria Bacillus. *J. Bact.*, 20, 2: 107 (Aug.), 1930.

# NEWS FROM THE FIELD

## WISCONSIN MEDICAL SOCIETY

AT the meeting of the State Medical Society of Wisconsin, September 9-11, Dr. C. A. Harper, State Health Officer, was elected President. At the annual banquet, Dr. A. W. Rogers, in the name of the society, presented him a gold medal in the following words:

A son of Wisconsin, a practicing physician since 1894, appointed to the State Board of Health in 1907 by Governor La Follette and serving continuously since with no appointments from Governors Davidson, Philipp, Blaine and Kohler; for your twenty-nine years of membership on that Board, twenty-seven years as Secretary, for your closer vision, for your careful and untiring work in the interests of all people as Health Officer of this state, and for your service as a counselor and officer of your State Medical Society, we, your fellow members, give you this seal of our Society as a token of your achievements, and our esteem and affection.

## ARGENTINA ESTABLISHES A "MODEL INSTITUTE OF MATERNAL AND CHILD HYGIENE"

THE President of the National Department of Hygiene of Argentina has recently ordered the establishment of a "model institute of maternal and child hygiene."

The institute will have a practical school for the training in child care of physicians, nurses and dietitians.

It will also provide continuation courses for physicians who are in charge of child health centers, and will organize traveling centers for maternal and child hygiene in the rural districts of the country.

## WEST VIRGINIA NURSES

OCTOBER 23-25, the State Nurses Convention met in Fairmont, W. Va., and many interesting papers were presented.

## NURSES' GRADING STUDIES

IN her paper entitled "The Student's Share," May Ayres Burgess has presented, through graphs, the amount of time spent by the student in the various nursing services. This appears in the October issue of the *American Journal of Nursing*.

## ROENTGEN PIONEER

DR. Christian Deetjen, pioneer in the study and use of the Roentgen or X-ray, had his right arm amputated at the elbow as a result of his medical research. This is reported to be the eighth operation he has undergone due to his research work.

## LUNG MACHINE

PHILIP Drinker, A. P. H. A. member, of Harvard, has invented a respirator, an airtight metal box mounted on wheels, big enough to contain a man, leaving his head out. Its purpose is to prolong artificial respiration beyond the period possible by manual methods. It was demonstrated recently before a delegation of police and fire surgeons in Boston.

## STANDARDS FOR MATERNITY CARE

A REPORT has just been published on Standards for Maternity Care, prepared by the Committee on Maternity Care of the Children's Welfare Federation and a Committee appointed by the New York Obstetrical Society. This is a 32-page booklet published by The Children's Welfare Federation, 244 Madison Avenue, New York, N. Y.

## NURSING CALENDAR

THE National League of Nursing Education has prepared an attractive calendar for 1931. This includes unpublished pictures of Florence Nightingale's birthplace, the Villa Columbaia, in Florence. The price is \$1.00 for a single copy, \$.75 in quantities over 50. National League for Nursing Education, 370 Seventh Avenue, New York, N. Y.

## MOTOR FATALITIES

DEATHS from automobile accidents in the United States in 1930 will probably total about 33,000, and there will be more than 100,000 accidental deaths in all. So Dr. Louis I. Dublin reported to the National Safety Council at its meeting in Pittsburgh on September 29.

## PARROT HAS HEALTH CERTIFICATE

A PARROT was recently brought into the United States with four health certificates. It had been bought in Belgium, and one of the certificates was from the Belgian Government.

## PERSONALS

KARL F. MEYER, PH.D., director of the Hooper Foundation for Medical Research, has been appointed chairman of the committee on undulant fever of the National Research Council.

DR. MARTIN J. LACEY has been selected as health officer of Albany, Calif., succeeding Dr. Jack L. Stein.

DR. LINDLEY H. ESHLEMAN has been

appointed city health officer of Marion, Ind.

DR. FRANK L. WATKINS, director of health education in the public schools of Tulsa, Okla., was recently elected city-county health officer of Great Falls to succeed Dr. Thomas F. Walker. Dr. Watkins was formerly in charge of the Ohio Bureau of Vital Statistics and was affiliated with the Mississippi and Florida state boards of health.

J. H. SHRADER, PH.D., M.D., has been appointed Associate in the Department of Chemical Hygiene in the Johns Hopkins School of Hygiene and Public Health, to teach the course, Public Health Aspects of Food Production and Distribution.

DR. H. JACKSON DAVIS, who has been epidemiologist for the New York State Department of Health, has become Acting Health Commissioner of Cortland Co., N. Y., during the absence of Dr. Daniel R. Reilly, who, under a Rockefeller Foundation Fellowship, is taking a year's course in the Johns Hopkins School of Hygiene and Public Health.

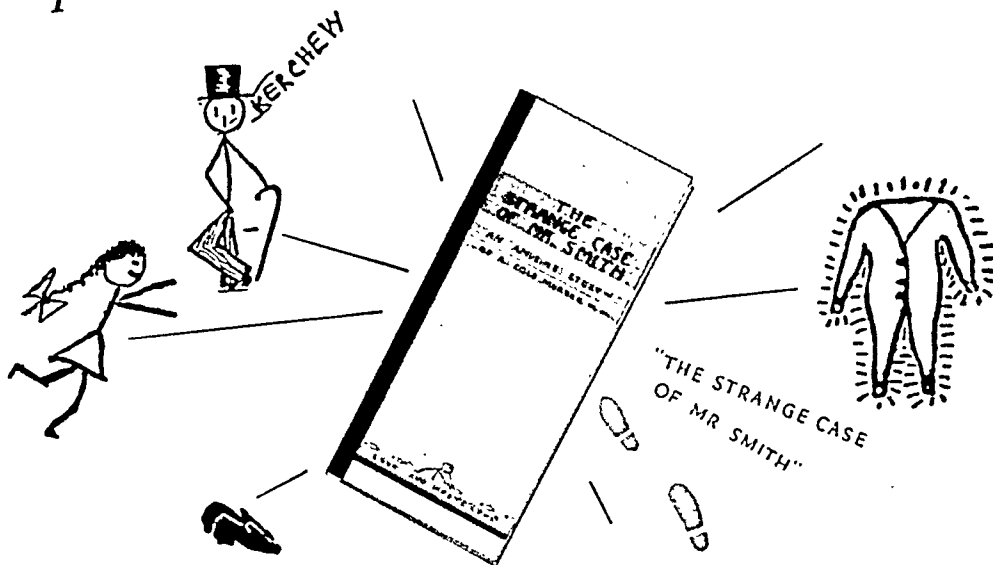
## CONFERENCES

Oct. 30-Nov. 1, American Water Works Association, California Section, Annual Convention, Pasadena, Calif.

Nov. 19-22, White House Conference on Child Health and Protection, Washington, D. C.

Nov. 30-Dec. 6, Asociacion Medica Mexicana, Guadalajara, Jalisco, Mexico.

**P**eople who read this amusing little book should



## Have Fewer Colds This Winter

When we refer to Mr. Smith's adventure as a "case," we mean that Mr. Smith had a bad cold in the head.

In fact, as the author says, "Besides having a bad cold in the head, Mr. Smith also had a wife, Mrs. Smith, who also had a cold in the head, and a daughter, Elithabeth Thmiff, who thome-how alwayth had a code in the heb. . . ."

Yet, "the Smiths *always*

wore their rubbers . . . they were *always* rubbing their chests with something . . . they *never* sat in a draught . . . and in cold weather all three wore their prickly underwear.

"So *how* did the Smiths get their colds?"

Whoever you are, health worker, teacher, mother or just ordinary citizen, we urge you to send for this highly amusing yet thought-provoking little

booklet. Find out as the Smiths did how you get your colds . . . or how you may help others to take the precautions that they should.

Here is excellent early-winter reading for anyone. So mail the coupon promptly for your *free* copy of "The Strange Case of Mr. Smith." (Additional copies by special request or at cost.)

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# American Journal of Public Health

## and THE NATION'S HEALTH *Vol. XII No. 12*

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Volume XX

December, 1930

Number 12

## Time, Coöperation and Research Measure Success in Health Work\*

A. J. CHESLEY, M. D., F. A. P. H. A.

*State Health Officer, St. Paul, Minn.*

THE slogan: "All things come to him who waits" is all right for a "tree-sitter," but Lindbergh preferred the World War slogan: "Let's go!" "It won't be long now," the newspapers said, when Lindbergh took off to cross the sea or die. The instant he landed, the Eifel Tower wireless flashed the news to Arlington. The War Department offices were notified first. At that moment a delegation of state health officers accompanied by Dr. Maurice Seymour, of Saskatchewan, President of the Conference of State and Provincial Health Authorities of North America, and led by the President-elect, Dr. Samuel Welch of Alabama, was making a plea in the War Department Office to General Lord, Director of the Budget, for additional funds to be used for health work in the flooded Mississippi valley. General Lord interrupted Dr. Welch, answered the telephone and repeated the thrilling message: "Lindbergh has landed in France."

Of those present, General Lord, Dr. Seymour and Dr. Welch have crossed the Great Divide. The others have a lasting and vivid mental picture of that incident. It emphasized the facts that distance is now measured by time alone; that natural barriers to disease importation no longer exist; and while new safeguards are needed the new potential hazards of disease spread are offset by easy and almost instantaneous communication between remote parts of the world. Today, October 27, regular commercial service between North America and Australia was begun by the American Telephone and

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\* Address of the President of the American Public Health Association, delivered at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

Telegraph Company. The wire lines between New York and Sydney stretch over 14,000 miles and radio spans the seas.

Airplanes for investigation and wireless broadcasting of the facts concerning epidemics or threatened epidemics save time. These agencies are available for international and national, and in a few places, for state or provincial use, and should be universally adopted. They give the health authorities and allied agencies time to prepare a successful campaign for prevention or control. Their proper use by epidemiologists and other trained public health personnel will save lives, and prevent sickness and economic loss.

Reciprocal notification of epidemic diseases dates from 1879 when Dr. Charles N. Hewitt, Secretary of the Minnesota State Board of Health, Charter Member of this Association and its president in 1888, arranged for interchange of information between Minnesota, the province of Manitoba, the territory of Dakota and the states of Wisconsin and Iowa. Dr. Hewitt visited Canadian quarantine stations and, assisted by Dr. Frederick Montizambert, later Director General of Public Health of Canada and president of the American Public Health Association in 1891, entered into an agreement for reciprocal notification between Minnesota and the different Canadian ports which at that time did not report to each other but only to the Dominion headquarters office.

Cholera, plague and yellow fever led 12 European nations in 1851 to exchange information and adopt uniform preventive measures. These diseases were the primary concern at the Philadelphia Conference of 1857 called by the Health Boards of New York, Philadelphia, Boston, Baltimore and New Orleans, and attended by 73 delegates from 9 Atlantic states representing 26 boards of health, boards of trade and medical societies of the principal seaboard cities. This "Quarantine and Sanitary Conference" met in 1858, 1859 and 1860. In 1861 the Civil War interrupted its work.

The cholera epidemic of 1866 enabled the newly organized Metropolitan Board of Health to demonstrate its efficiency and paved the way for state legislation. The Massachusetts State Board of Health was established in 1869, the California Board in 1870, the Minnesota Board in 1872.

It is interesting to note that in 1872 when the American Public Health Association was organized Canada was represented by Dr. William Marsden of Quebec on the Committee on Permanent Organization, of which Dr. Stephen Smith was chairman; Massachusetts by Dr. George H. Derby, Secretary of the State Board of Health; the United States Army, the Navy and the Marine Hospital Service by medical

officers; while the other members represented Alabama, California, Connecticut, Illinois, Louisiana, Missouri, New York, Ohio, Pennsylvania, South Carolina, West Virginia, and the District of Columbia. Among the 67 members elected before the constitution was adopted were Dr. Phillip Carpenter of Montreal, Dr. Thomas M. Logan, Secretary California State Board of Health, Dr. Charles N. Hewitt, Secretary Minnesota State Board of Health, and Dr. George W. Peate, Health Officer of Galveston, Tex.

At the American Public Health Association meeting of 1875 a communication was read from the Secretary of the Association of Health Officers of the Lower Rhine requesting to be put in full fellowship with the Association for mutual interchange of publications. The American Public Health Association named ten delegates to attend the International Medical Congress at Philadelphia in 1876.

Thus coöperation and reciprocal notification in communicable diseases was begun here and abroad. Later, international organizations, official and nonofficial, relating to every phase of public health and welfare sprung up.

At least two Canadians helped organize the American Public Health Association in 1872, but Canada did not officially join until 1884. Five distinguished Canadian sanitarians have been presidents—Dr. Frederick Montizambert, 1891; Dr. Emmanuel Lachapelle, 1894; Dr. Peter H. Bryce, 1900; Dr. Robert M. Simpson, 1911; and Dr. Charles J. Hastings, 1918. Four times the standing and annually reiterated invitation from Canada to meet in one of her cities has been accepted—Toronto, 1886; Montreal, 1894; Ottawa, 1898; and Winnipeg, 1908. In 1889, Mexico, Cuba, Colombia and the Central American countries were invited to join. In 1890 the Superior Board of Health of Mexico sent delegates, and in 1902 Cuba entered the Association.

Dr. Eduardo Liceaga joined the Association in 1891, became president in 1896 and always took an active part in its affairs. To honor him the Association met in Mexico City in 1892 at the invitation of President Diaz, himself an Honorary Life Member. In his presidential address at Mexico City in 1892, Dr. Felix Formento said: "This is the first real International Health Congress on this side of the Atlantic." Dr. Domingo Orvananos, Delegate in 1890, was elected president at the second meeting held in Mexico City in 1906.

Dr. Carlos J. Finlay of Cuba, "the first to affirm the mode of transmission of yellow fever by means of the mosquito," was our president in 1904 and presided at the meeting in Havana in January, 1905. In 1911 the Association returned to Havana. Those fortunate members

who attended the meetings in Canada, Mexico, and Cuba, will certify that the facilities provided for the sessions and the quality of the reception cannot be excelled. Dr. Aristides Agramonte, whose name always will be associated with Finlay, Reed, Carroll, Lazear, Gorgas, and Guitéras in connection with yellow fever will address the Association at the final session Thursday evening, October 30.

Through the application of the results of the work of these great men, yellow fever—which for more than a century retarded our development, caused great loss of life, and forced upon infectible territories a system of drastic, highly individualized quarantines that cost hundreds of millions of dollars in delays to commerce—was first rationally dealt with from a quarantine standpoint, by the First Pan-American Sanitary Conference which met in Washington in 1902. Since that time this disease has been eradicated from all its strongholds in America save Brazil and—barring the possibility of its re-introduction by the rapid development of airplane traffic—ceases to be the dreaded scourge that it was in former times.

The Second Pan-American Conference, in 1905, adopted a treaty known as the Washington Convention which was a great step in advance in standardizing international quarantine procedures in America and abroad. The Washington Convention was the precursor of the present Pan-American Sanitary Code adopted in Havana in 1924 and since ratified by 17 American republics. This Code further unifies and standardizes our international procedures in the field of public health and obligates the signatory powers to report promptly all outbreaks of quarantinable diseases and the measures being taken for their control.

When the proposal to establish the Office International d'Hygiène Publique was accepted in 1907 by 12 European nations and the United States, Dr. Allan J. McLaughlin of the U. S. Public Health Service, president of the American Public Health Association in 1922, was the delegate of our government. This agency, set up at Paris in 1908, placed official coöperation on a permanent international basis and, through its relations with the Health Section of the League of Nations, information regarding outbreaks of quarantinable diseases is immediately available as they occur, practically throughout the entire world.

The directors of health from 21 American Republics will meet in Washington in 1931, and then attend the 46th annual Conference of State and Provincial Health Authorities of North America and the 28th annual Conference of State and Territorial Health Officers with the U. S. Public Health Service.

All Canadians who belong to the American Public Health Associa-

tion are members of the Canadian Public Health Association. They are as active and loyal in this Association as in their own. The same may be said of the members of the Conference of State and Provincial Health Authorities of North America; yet when the first Conference of State Health Officers was held at the time of the American Public Health Association meeting in 1884 some people feared that the Association would be weakened through withdrawal of representatives of state boards of health therefrom. The objectives of the Conference of State Health Officers are stated in the report of the Minnesota State Board of Health for 1883-1884 by Dr. Hewitt, who proposed the organization in 1879. They are very similar to those of the new International Association of Medical Health Officers about which there is now some apprehension.

While I venture no recommendation on matters of policy or of administration of the American Public Health Association, I believe that we should act with the courage of our convictions now and have faith in the future of the Association. A review of the history of our Association since its organization in 1872 shows that it has not yet attained the place its founders and sponsors marked for it.

In 1929 the Governing Council adopted a plan which places responsibility for administration upon the Executive Board and four standing committees: Fellowship and Membership, Meetings and Publications, Administrative Practice, and Research and Standards.

In June the Western Branch of the American Public Health Association met at Salt Lake City and ratified the Constitution and By-laws prepared by a committee appointed by Dr. W. C. Hassler and approved in principle by the Executive Board April 4, 1930. A program of great interest and value arranged by Dr. Hassler and Dr. William P. Shepard, Secretary, was carried out, and the enthusiastic appreciation, by the large assembly, of the hard work of Drs. Hassler and Shepard in building up the membership convinced everyone that the Western Branch will grow and be the means of speeding the progress of health work in the mountain and Pacific states and western Canada. Dr. H. M. Bracken, State Health Officer of Minnesota, 1897-1919, and since in Veterans' Bureau service and with the Los Angeles Health Department, now edits the Health Section of the *Western Hospital Magazine* which has been made the local organ for the Western Branch.

Reports of the work of the four standing committees and of the Salt Lake City meeting have been made to the Governing Council. A special committee named by the Chairman of the Executive Board at its last meeting reports to the Governing Council as follows:

THE AMERICAN PUBLIC HEALTH ASSOCIATION  
ITS OBJECTIVES AND A PLEDGE OF THEIR ATTAINMENT

Our permanent objective is the effective control of preventable disease, and the security of health for all the people of our countries.

The first necessity to attain this objective is:

A full-time health service with trained personnel for every community and provision of adequate public funds for its support.

The first fruits of such organization and support of public health knowledge and resources will be:

1. Reduction of the maternal mortality rates so that the United States and Canada will be second to no nation in the safety of motherhood.
2. Securing normal growth of body and mind for children, and their training in the laws and personal practices of a healthy life.
3. Protection of life and limb and promotion of health for the working man and woman.
4. An adequate supply of safe milk for every community.
5. An adequate supply of pure water for every community.
6. Elimination of tuberculosis, malaria, hook-worm disease, typhoid fever, diphtheria and smallpox among the communicable diseases of which we have sufficient knowledge.

The American Public Health Association pledges to the health workers and to the people of our member nations vigorous coöperation in carrying these projects to a successful conclusion.

May I suggest that when you consider these reports you read again the address of President Fuller, and 3 other articles published in our JOURNAL:

1. Coöperation and Coördination of Voluntary Public Health Organizations, by Frederick R. Green. January, 1915.
2. Teamplay in Public Health, by George E. Vincent, President of the Rockefeller Foundation. January, 1919.
3. The American Public Health Association, Present, Past and Future, by W. S. Rankin. April, 1920.

If you do so, I think you will agree that while another year of experience is needed to determine whether the present plan is satisfactory, the early adoption of certain measures for the advancement of the Association is very desirable. The Association program for study and improvement of Administrative Practice has had a considerable and direct effect upon the organization of health work in the United States and Canada and in many countries abroad. Without the generous contributions from the Metropolitan and other life insurance companies, the Commonwealth Fund, and the Milbank Memorial Fund, the Association would not have been able to initiate this work or to provide for its continuance.

Certain recent events indicate that the present public health situation is better and its future brighter than ever. For example, President Hoover said in his message to Congress December 4, 1929:

The advance in scientific discovery as to disease and health imposes new considerations upon us. The Nation as a whole is vitally interested in the health of all the people; in protection from spread of contagious disease; in the relation of physical and mental disabilities to criminality; and in the economic and moral advancement which is fundamentally associated with sound body and mind. The organization of preventive measures and health education in its personal application should be as universal as public education. Its support is a proper burden upon the taxpayer. It cannot be organized with success, either in its sanitary or educational phases, except under public authority. It should be based upon local and state responsibility, but I consider that the Federal Government has an obligation of contribution to the establishment of such agencies.

In July, 1929, a White House Conference on Child Health and Protection assembled at President Hoover's request "to study the present status of the health and well-being of the children of the United States, to report what is being done, to recommend what ought to be done and how to do it." Members of this Association have worked earnestly as members of the White House Conference. Dr. William F. Snow of President Hoover's planning committee will outline the work during this meeting. In November a report will be made to the public. It will be followed by action for child health and protection. This Association will do its part.

Members of this Association are working on that important project known as a Study of the Costs of Medical Care, which concerns the people even more than the doctors, nurses and institutions engaged in the care of the sick. The facts already gathered indicate that changes of importance in the relation of medical service and the public health are imminent. The programs of the Rosenwald Fund, the Duke Foundation, and the Commonwealth Fund as they relate to community hospitals and to medical services may do much to influence these changes.

A most significant event of a different character but of world wide influence was the ceremony in Memorial Continental Hall, Washington, April 8, 1930, at the observance of the 80th birthday of Dr. William Henry Welch. Scientific gatherings throughout the world heard the President of the United States over the radio refer to Dr. Welch as "our greatest statesman in the field of public health," adding that "in organizing and directing research and application of medical knowledge on a wider field of prevention of diseases, he is among the preëminent few who deserve the title of statesman."

The passage in 1930 without opposition in Congress of certain acts

which this Association had advocated renewed our courage and faith in the future of public health work. The Honorable James S. Parker, Chairman, Committee on Interstate and Foreign Commerce, sponsored a bill that

. . . aims better to coördinate the public health activities of the government, especially of the Public Health Service; to give more specific statutory authority for certain activities of the Public Health Service and, to a limited extent, to broaden others; to improve its administrative procedure; to change the name, increase the personnel, and enlarge the functions of the Hygienic Laboratory Board and to authorize the establishment of new divisions in the Hygienic Laboratory; to increase the pay of officers of the Public Health Service; and to place the dental, sanitary engineer, and certain pharmacist personnel of the service upon the same commissioned basis as the medical officers.

Senator Joseph E. Ransdell, of Louisiana, was the author of legislation entitled—

An act to establish and operate a National Institute of Health, to create a system of fellowships in said institute, and to authorize the government to accept donations for use in ascertaining the cause, prevention and cure of disease affecting human beings and for other purposes.

Dr. George W. McCoy, who has so ably directed the Hygienic Laboratory, now becomes the director of the National Institute of Health. The Secretary of the Treasury has accepted from the Chemical Foundation, Inc., under the provision of the Ransdell Act a gift of \$100,000 for basic chemical research. Bona fide health authorities of states, counties and cities find the facilities of the National Institute of Health available for their study and instruction. Fellowships are provided for, either at the Institute itself or at other research institutes both in America and abroad. The Institute will be housed in a new building with adequate equipment.

Several federal departments publish reports and bulletins of great value to public health workers. The *Weekly Public Health Reports* give the latest information on prevalence of disease and contain special articles by the highest authorities on medical and sanitary science. The phrase which precedes, "Prevalence of Disease," is quoted daily—"No Health Department, state or local, can effectively prevent or control disease without knowledge of when, where and under what conditions cases are occurring." To this simple sentence Dr. John W. Trask, of the U. S. Public Health Service, boiled down his excellent article "Public Health Administration, Its Dependence upon Reports of Sickness." The bulletins of the Hygienic Laboratory are studied and treasured for reference. We thank the U. S. Public Health Service for the wide and free circulation of its publications.



The publications of the Army and Navy Medical departments are not so widely circulated. Public health workers who do not receive them are missing very valuable material. I refer to *The United States Naval Medical Bulletin* and to the special bulletins issued by the Army. Recently, *Army Medical Bulletin No. 23*, an excellent textbook on Military Preventive Medicine, was published under the direction of Major General Ireland, Surgeon General. The author, Major George C. Dunham of the Medical Field Service School, Carlisle Barracks, Pa., is well known in this Association.

There is a service of greatest importance of which I wish to speak. Unhampered by governmental restrictions, without a trace of selfish motive, with no desire for publicity, and firm in disapproval of propaganda, the International Health Division of the Rockefeller Foundation carries on a most effective world-wide campaign for the advancement of public health.

In the annual report of the Rockefeller Foundation for 1929 it is noted that the expenditures for all activities of the International Health Division, July 1, 1913, to December 31, 1929, amounted to \$39,815,421.50. Nearly \$3,000,000 was spent to aid Local Health Departments; over a million for State Health Services; \$1,200,000 for Field Service Expense, not pro-rated to Specific Budgets; \$2,737,000 for Public Health Education; more than \$800,000 for the Health Organization of the League of Nations; and nearly \$15,000,000 for the Investigation and Control of Specific Diseases.

Dr. Frederick F. Russell and his associates, Dr. John E. Ferrell, Dr. Victor G. Heiser, Dr. Hector H. Howard and Dr. Wilbur A. Sawyer, direct the work of the International Health Division. Members of its staff are scattered over the world, and wherever an emergency exists or there is an opportunity for field study and scientific research which may result in benefit to the public health, reduce sickness or save lives, the International Health Division will be found quietly carrying on its work. Many members of its staff have lost their lives in such endeavor. On June 30, 1929, a young scientist of great promise lost his life in the investigation of yellow fever. The members of this Association while glorying in the achievements of men of this character have the deepest sympathy for the members of his family and most sincerely regret his death. I refer to Dr. Theodore B. Hayne of Columbia, S. C., the son of Dr. James A. Hayne, State Health Officer.

You are well acquainted with what the International Health Division does and with its representatives in laboratory, office, and field work. Its splendid coöperation with governmental agencies—

national, state, provincial and local—is always most satisfactory. This is due to the policy of the Foundation which from its beginning has limited its health work to direct relations with governmental authorities—national, state or provincial and local. While campaigns have been directed against hookworm disease, malaria and yellow fever, the real purpose has been to use these control measures to build up official health organizations. The most notable example in the United States of the success of this policy is the continuance of the full-time health organizations established during the Mississippi flood of 1927. Eighty-five of the 100 counties where full-time units were established during the emergency have placed them on a permanent basis.

The Foundation in refusing to furnish aid to private health societies has no thought of questioning the value of these agencies. It has simply chosen a line of effort which seems to present permanent results in strengthening the official departments which have responsibility for protecting and promoting the public health.

The southern states have good reason to appreciate the aid of the International Health Board, and its predecessor, the Rockefeller Sanitary Commission, and also the coördinated activities of the U. S. Public Health Service.

Dr. George E. Vincent retired from the presidency of the Rockefeller Foundation December 31, 1929, and was succeeded by Dr. Max Mason. It would be appropriate for this Association to express its appreciation of the distinguished services of Dr. Vincent in the field of public health and to send its cordial greetings to Dr. Mason, whose scientific career indicates his high qualifications for this most responsible position of President of the Rockefeller Foundation.

At the present time there are at least three problems which require the fullest coöperation for their solution. An honored member of this Association, Dr. William Royal Stokes, lost his life, and a number of other research workers' lives were jeopardized through their work during the outbreak of psittacosis. Many official reports on the outbreaks in the United States and Canada have been published. Still the problem is not solved. The outbreak of typhus fever in 1930 presents some interesting and unsolved problems. Malaria has shown undue prevalence in certain northern states and invites careful epidemiological study. Rocky Mountain spotted fever is spreading. Two wood ticks that infest man and are able to carry spotted fever, *Dermacentor variabilis* and *Dermacentor occidentalis*, overlap the territory infested with *Dermacentor andersoni*, and the possibilities of spread through the agency of these ticks seem considerable.

Dr. William C. Hassler, President of the Western Branch of the American Public Health Association, and Dr. W. P. Shepard, Secretary, arranged a symposium on spotted fever for the meeting at Salt Lake City last June. An exhibit by Dr. R. R. Parker, of the U. S. Public Health Service, stationed at the research laboratory at Hamilton, Mont., attracted wide attention. Another exhibit by Dr. R. R. Spencer received the gold medal award at the Detroit meeting of the American Medical Association.

The present situation may be stated as follows: thirteen states are affected. Those most seriously involved are Idaho, Wyoming, Montana and Oregon, but the disease is endemic in California, Nevada, Utah, Colorado and Washington. It has spread into New Mexico, North Dakota, South Dakota and Nebraska. Epidemiological evidence indicates that in some of the recent cases in territory where *Dermacentor andersoni* is not found the disease has been transmitted by *Dermacentor variabilis*.

The Hamilton, Mont., laboratory during the past year has received 587 requests for spotted fever vaccine for use in Canada, California, Colorado, Idaho, Minnesota, Montana, Nevada, New Mexico, Oregon, South Dakota, Utah, Washington, and Wyoming.

The western states invaded have requested the Surgeon General of the U. S. Public Health Service to assume full control of spotted fever work by taking over the Hamilton laboratory, erected by the State of Montana, and extending the scope of the work as he may deem necessary. It is desired that spotted fever research, including tick parasite work, but not including control work such as rodent destruction, dipping of domestic animals and quarantine, should become the responsibility of the Service, while control work will be continued under the state authorities.

The Montana State Board of Entomology (Dr. W. F. Cogswell, Dr. W. J. Butler and Prof. R. A. Cooley), organized 18 years ago, has worked continuously on Rocky Mountain spotted fever and is now of the opinion that the use of parasites to destroy ticks is the most practical and most promising line of control work. This Board is already at work with the French tick parasite (*Ixodiphagus caucurtei*), but other parasites wherever they may occur should be found and imported. If one parasite is good, more would be better, and it is far from wise to rely on one alone. Prof. Cooley conducted research in Africa in 1928. He found two tick parasites new to science but the federal government would not permit him to bring them into the United States until their habits could be thoroughly studied in Africa. Effort is now being made to secure a fund to send Prof. Cooley back to

Africa to search for new tick parasites, study their habits, and prepare them for shipment to America, and particularly to study the two parasites discovered in 1928.

Successful research of this character would solve problems that puzzle epidemiologists and enable public health administrators to employ means for control and eradication of diseases affecting animals and man which now cause suffering, loss of life and great economic waste.

The ultimate success in world-wide control of preventable diseases and of the effort to improve the health of the people will be measured by the efficiency of local health units. Governmental co-operation and scientific research will become most effective when utilized in every community by trained public health personnel. To the promotion of coöperation and of research and to the organization of efficient local health units in every community the American Hygienic Health Association has pledged itself.

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## A Summary of the Records of Sixty-five Cases of Recoveries from Leprosy

A REPORT recently issued by the U. S. Public Health Service gives an interesting summary of the value of medical treatment for leprosy at the National Leprosarium which is conducted by the Service at Carville, La. More than 300 lepers, men, women and children, are under treatment there.

During the past 10 years, 65 lepers have been discharged from this hospital as apparently recovered from leprosy and no longer a menace to the public health. The average period of hospital care varied from 5 to 9 years. The shortest period of treatment was 1½ years and the longest was 17 years. Fifty-five of these patients received crude chaulmoogra oil by mouth, and 16 of this group received no other medicine. Twelve received benzocaine-chaulmoogra oil by intramuscular injection, and 4 of these received no other medical treatment. Twenty-one received the ethyl esters of chaulmoogra oil by intramuscular injection, and 8 of these received no other medicine.

The basic treatment of leprosy is similar to that for tuberculosis, and all lepers at the National Leprosarium, no matter what medicines are given, follow a sanatorium regimen of food, fresh air and rest, almost identical with that prevailing in a tuberculosis hospital.

# The Precise Evaluation of Light Therapy in Experimental Rickets\*

JOHN W. M. BUNKER, PH. D., AND ROBERT S. HARRIS, S. B.  
*Professor of Biochemistry and Physiology; and Research Associate; Massachusetts  
Institute of Technology, Cambridge, Mass.*

THE use of ultra-violet light in prevention and cure of rickets is well known. The ultra-violet which is commonly believed to be most efficacious is between line 2,800 and line 3,100 Å. As far back as 1923 Weid Weinstock<sup>1</sup> came to the conclusion that antirachitic radiations are limited to the zone 2,960–3,020. Others since that time have reported limits varying from these in some degree, but in the main it is today generally accepted that the antirachitic radiations are in the neighborhood of 3,000 Å.

The majority of the experimental data upon which are founded conclusions which have set these limits to the so-called "vital rays" have used as light sources mercury vapor arc lamps in quartz glass. The method in general was to employ filters of different selective absorption values which cut off short wave light up to a certain wave length, and in fewer cases cut off the visible end of the spectrum. One investigation by Sonne and Reckling<sup>2</sup> in 1927 made use of a quartz prism monochromator instead of filters. By this means it was possible to separate the lines of ultra-violet and to irradiate limited areas of white rat bodies with monochromatic ultra-violet light of different wave lengths between 2,200 and 3,560 Å. This would be an ideal way in which to investigate the problem of specific therapy from differing wave lengths if the volume and intensity of the illumination were sufficiently great. The size and cost of equipment to furnish a proper integration of ultra-violet light of sufficient intensity and dispersion completely to irradiate experimental animals is such that to date no such apparatus has been built.

A consideration of the various results obtained from the use of light filters may raise some doubt as to the validity of the general assumption that the therapeutic zone of light in successful treatment of

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\* Read before a Joint Session of the Food, Drugs and Nutrition and the Child Hygiene Sections of the American Public Health Association, at the Fifty-ninth Annual Meeting at Fort Worth, Texas, October 27, 1930.

rickets lies solely within the limits generally accepted. The principal reason for this doubt is the fact that experiments generally seem to have been planned without due regard for the fact that a "dose" of radiation energy is composed of two factors, intensity and duration. This makes necessary, for any valid comparison of different zones of light, not merely an equal time of exposure to different light bands but also the equalization of intensities of corresponding lines within the bands selected. It is admitted that occasional mention of energy measurement appears in the literature, but it is probably equally admissible that more exact work is required to support convincingly or combat the general conclusions which have been drawn. It is perhaps significant that the work, which from its published report seems to have included the most adequate precautions for securing a constant product of time and intensity, that of Sonne and Reklings, sets limits for antirachitic activity decidedly wider than the generally accepted limits.

In respect to visible light there seems to be no challenge of the theory that it is not effective in rickets therapy.

Attention has turned naturally to the question of the effect of infra-red radiations in rickets therapy since all ordinary sources of ultra-violet are at the same time sources of visible and of infra-red radiations. Hess and coworkers<sup>3</sup> reported in 1922 their finding that infra-red radiations interfere with antirachitic effect of ultra-violet, a conclusion which seems to have been corroborated by Clausen<sup>4</sup> in 1929. Reference will be made later to this point in respect to results obtained by the authors.

From the point of view of physics, it is recognized that light from any source is made up of lines differing from each other in frequency of vibration. Any photo-chemical effect is a function of frequency, intensity, and duration of exposure, since all these factors condition the input of energy by light. It is equally well established that the different lines of light from a quartz mercury arc vary greatly in individual intensities. It should be obvious that to compare the effect of a band of light containing lines of weak intensity with another band including corresponding lines of strong intensity, for the same length of time, may lead to erroneous conclusions as to the relative potency of the two bands in question.

For the above reasons, it was felt that there is needed an evaluation of different bands of light from the mercury arc lamp based upon comparisons wherein the intensity of light energy supplied should be equal in each case. Only from such a comparison can there be obtained a precise evaluation of light therapy in rickets.

In the attempt to secure such data at the Massachusetts Institute of Technology there were called in as collaborators Dr. Donald K. Stockbarger, radiations expert of the Department of Physics, and Dr. Edwin Wyman of the Children's Hospital in Boston, a recognized expert in successful application of radiations to rickets in children.

From the experiences of the authors in entering upon this, to them, new field of investigation there have arisen certain difficulties which it is felt may fall to the lot of any investigator in this field. From these experiences have arisen the suggested precautions which are offered in this paper for the benefit of others who are engaged in an attempt to execute precise experiments in this field of biophysics.

In the beginning of our work over 100 rats were carried through a period of 100 days in procedures gleaned from a study of the literature, before a single case of recognized rickets developed. The subsequent 700 or so animals used to date have behaved more satisfactorily.

We have come to the conclusion that it is possible to follow meticulously a classical method for developing rickets, and yet entirely miss the incidence of the disease. To prevent such disappointment we have outlined the following procedures which in our hands yield uniformly successful results.

The animals preferred are of Wistar stock, selected after comparison with stocks from other sources. The animals are bred in our own laboratory, using a diet for the mothers which is rather low in antirachitic factors, in so far as we know them, yet one which does not induce recognizable rickets in the parent or offspring. This diet was recommended by the Drug Manufacturers Association<sup>5</sup> in 1930. It consists of—

	Per cent
Ground entire corn, yellow	34.0
Ground entire wheat	33.0
Klim whole milk powder	21.0
Old process linseed oil meal	7.0
Green alfalfa leaf flour	4.0
Calcium carbonate	0.5
Sodium chloride	0.5

As we shall report in detail elsewhere, it is important to grind the corn into meal and then store it at ordinary temperature, covered from dust, for 6 months before using. Market corn meal is apt to be deficient in growth factors. Some samples of whole corn contain so much anti-rachitic principle that freshly ground meal transmits too much of it for subsequent methodical onset of rickets. We have not found it necessary to sterilize the ingredients, and have felt that to do so impairs the necessary vitamin content of the diet.

For water supply, the drinking bottles have been filled with tap water and distilled water in comparison, and no difference in Cambridge, Mass., is noticeable. The addition of a trace of iodine to keep down algal growths in the bottles has not been demonstrated to have any effect, although the recent report of Kay *et al.*<sup>7</sup> on the relation of thyroid activity and rickets should be kept in mind. All litters are reduced to six on the second day, and the animals are used for experimentation at age of 30 days, of weight 48 to 55 gm.

The rachitic diet of Steenbock No. 2965<sup>8</sup> has proved satisfactory since we standardized our ground corn to an age of at least 6 months. Previous to such procedure, when using fresh corn purchased from a large variety of sources, results were irregular and failure to develop rickets was the rule rather than the desired result.

Animals are kept on this diet for 24 days, being subjected to daily irradiation 7 days a week, and are then subjected to post-mortem findings by X-ray and the line test as modified and described below.

The preparation of light sources for irradiation is time consuming and requires the services of the radiation measurements physical laboratory. Filters have been employed for lack of the huge quartz monochromator which would of course be the ideal instrument.

A characteristic of light filters, not realized by some, is that they do not cut off sharply in their absorption. It is also unfortunate that two filter mediums which differ in the point of practical cut-off vary also in the relative intensity transmission of lines to which each is transparent. It is possible to say of any filter that it cuts off transmission of all radiations below a certain wave length, but it is equally true and unfortunate that the change from transmission to absorption is a sloping curve and not an abrupt line. We have found no common filters having a narrowly restricted zone of transmission in terms of wave length of sufficient relative transmission to be practical.

In our work, filters have been prepared of special glass and glass plus chemical solutions which cut off lines of shorter wave length than 2,650, and also successively increasing increments from the infra-red end of the spectrum. Since for each filter the relative transmission of lines common to all is variable, they have been standardized in sets to a common intensity at first one line and then another in the zone around 3,000. This has meant that through each filter the total energy has varied, but the energy at a particular line has been common to a whole set. Usually four filters have been used in this way at one time.

For a light source, Cooper Hewitt mercury vapor lamps have been employed each in a set-up standardized as to voltage, and at such a



distance from the animal bench that each delivers the same total energy from the bare arc. Each lamp was run for 100 hours to give the quartz the necessary preliminary aging. Each lamp is operated for the same length of time each day and all are frequently checked for uniform energy transmission.

A standardized dosage with the complete arc has been worked out which every time protects each of the eight control rats of an experiment against rickets.

Our diagnosis of rickets under these standard conditions is always by X-ray and line test on the femur bones of animals killed after 24 days. Macroscopic evidence of rickets has not been reliable in our experience. The line test is carried out in the classical manner with the exception that the split bones are held over night in the icebox in 10 per cent formalin and then after washing and the usual treatment with acetone and silver nitrate are exposed to ultra-violet light instead of the light of "a strong incandescent lamp." More positive demarcation of "lines" results.

In the X-ray pictures of the same bones, taken previously, a low voltage with slow development has resulted in formation of sharper shadows, more convincing to the examiner.

As the result of two years of continuous work, using upwards of 800 animals and employing the above precautions, but one repeatedly consistent result has been obtained. All animals subjected to the standard irradiation of measured intensity under the bare arc have been protected against rickets. In every other group excluding first infra-red, then visible light, then portions of the spectrum down as far as 3,300, with intensities equal at lines 3,000, or at 2,804, there has been some protection and some failure in protection. Single experiments can be selected from the list to prove that the vital band is restricted to a narrow zone and others to show equally convincingly that the therapeutic zone is wider. The unreliability of these experiments was demonstrated only by repeated checks and repetitions. Usually four repetitions of a given experiment were sufficient to show irregularities in results. Whether check experiments were carried out simultaneously on a given batch of animals or whether they were run successively under standardized conditions with the same identical set-up, the variations have occurred; yet all the while the control experiments with the bare arcs have been monotonously successful in protecting the animals, the intensity of the bare arc in the region of the so-called "vital band" always being equalized to the intensity of the same region of the filtered light.

In respect to the infra-red effects, our findings must be considered

tentative until several more repetitions of this work have been carried through. At present it appears that, whereas the bare arc unfiltered gives uniform protection, the same dosage if immediately followed by a certain amount of additional infra-red radiation lends protection in only about one-third of the animals. If, on the other hand, the infra-red treatment precedes the therapeutic dose of light from the bare arc, the protection is extended to two-thirds of the animals. Infra-red alone confers no protection. Moreover, in the case of a light filter which cuts off the short-wave middle ultra-violet but transmits in the zone of 3,000 with equal intensity to bare arc exposure, and transmits the remainder of the spectrum with varying intensities, there was at best 23 per cent protection if infra-red was a component of the total energy, but 40 per cent protection if the infra-red was removed by water. This appears to confirm and to amplify the findings of Hess and of Clausen.

### CONCLUSIONS

In precise evaluation of light therapy in experimental rickets it is necessary to exercise meticulous care in standardizing all procedures in respect to breeding and care of animals.

In the matter of diet, one factor which may be variable to a bothersome degree is the amount of antirachitic factor in freshly ground yellow corn, which variable can be reduced by definite aging of the corn meal before use.

In comparison of different light zones, the characteristics and limitations of selectively absorbing filters must be understood, and compensations therefor be introduced into the set-up.

Numerous repetitions of each set of experiments, with controls common to all compared conditions, must be carried out.

In the light of results obtained, it is felt that the rather general belief that anti-rachitic effect of light in rickets prevention in white rats is confined to the zone of ultra-violet in the neighborhood of 3,000 Å. and that other parts of the spectrum from the mercury arc lamp are without contributory effect, is a belief that is not adequately supported by experimental evidence.

It is, in our opinion, still a possibility that the future will show that radiations longer or shorter in wave length than those of the alleged "vital band" of ultra-violet may assist in the biochemical processes of rickets therapy.

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# Evolving a Health Department

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THE best way to secure a profitable discussion of health work as a governmental function is to take the actual experience of a health department, describing its problems and its phases of evolution.

Although Hippocrates warns us, "Experience is fallacious," I sympathize with Patrick Henry who said that he had "no other guide"; and I might add another maxim: "By knowledge is a house builded and by wisdom is it established."

In 1908, the General Assembly of Virginia, with the cordial approval of the governor, reorganized the State Board of Health and actually created a health department for the state. Prior to that year, health measures were limited to activity in the presence of large epidemics, chiefly smallpox, and the issuance of occasional literature.

Preventive medicine is probably still in its infancy; but it has made remarkable progress in popular esteem during the last quarter of a century, and much has been added to its strength. The vastly increased state and federal appropriations of today are a tribute to the intelligence of the people who are in annually increasing numbers becoming convinced that many of our diseases can be and should be prevented.

It may serve to show how intelligently our legislators viewed health work if I give the authorized personnel of the new department created in 1908. It was to consist of a commissioner, an assistant commissioner and a bacteriologist; but there was no doubt as to the intent of the law makers. They wished to insure the utilization of the knowledge then available, and they prescribed that the commissioner "be versed in bacteriology and sanitary science," that the assistant commissioner have similar qualifications, and that the bacteriologist be "competent." To carry out the provisions of the new law, and to make the work effective, an appropriation of \$40,000 annually was provided.

Then came the duty of formulating plans and policies for the profitable expenditure of the appropriation. The new commissioner had no "lamp of experience"; so he sought to study by the lamps of others. He visited a number of other state health departments—

there were not many of them at that time—but he found no standards. He returned to Virginia feeling sure the work was in a pioneer stage and that the wisest course would be to begin by adapting to the chief needs of his state such knowledge as was available.

Even this elementary conclusion had its qualifications. A point at once to be established was—the field of the health department. Obviously it should not engage in curative medicine for that was an individual, rather than a public, concern; but there were other fields less clearly marked. The state was then, as it is now, recognizing as a public duty certain medical activities, such as the support of medical colleges, the licensing of medical practitioners, the free treatment of certain indigent patients at state supported hospitals, the maintaining of hospitals for the insane and schools for the deaf and blind.

We decided that none of these activities should properly fall within the purview of public health endeavor, even though some of them might have a distinctly public viewpoint; but there were some other activities discussed later that could not be so rigidly excluded.

Our first principle was: It is the duty of the health department to work for the benefit of the general population rather than for the benefit of any individual.

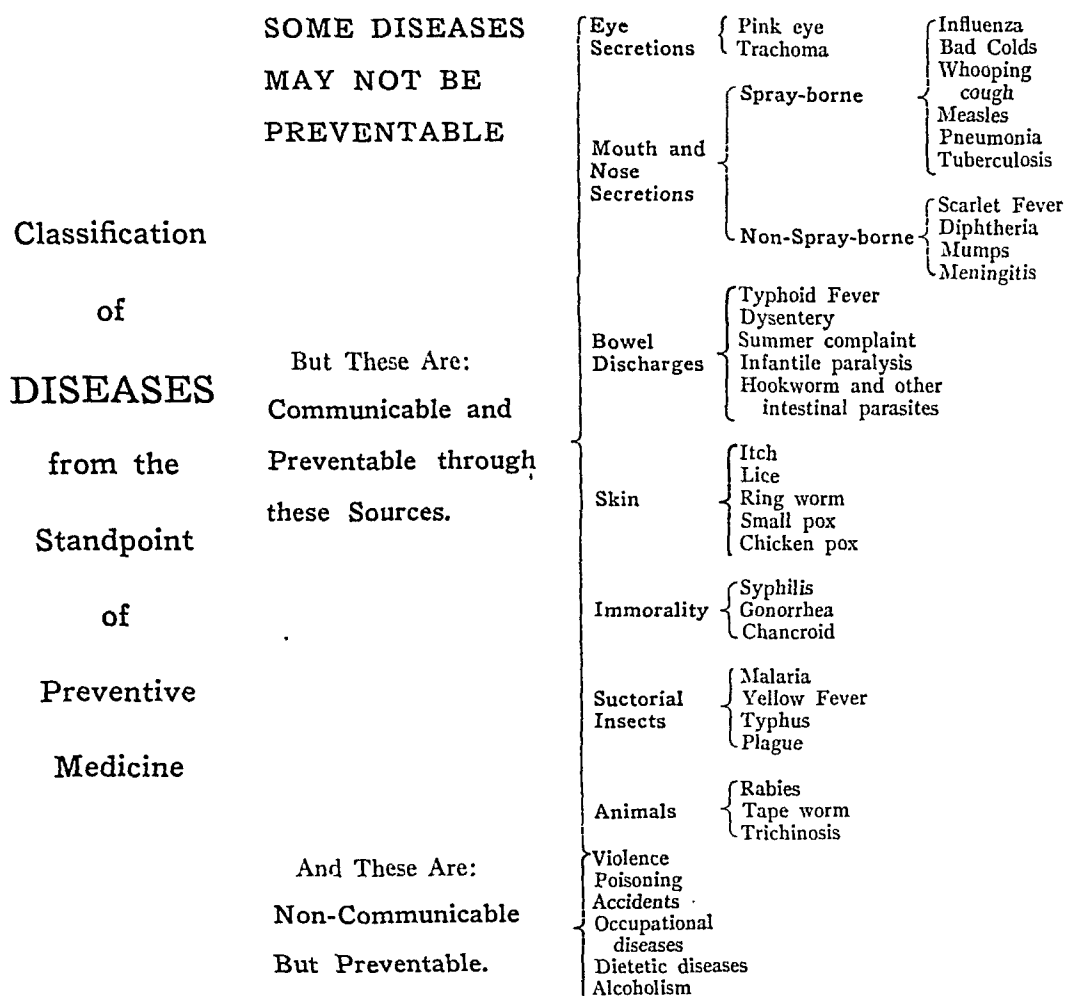
At once this marked the public health field as separate and distinct from the domain of the private practitioner, whose first duty is to his patient; but later we found that it was far easier to make such a distinction than it was to adhere to it rigidly. We found that we would have to modify our first principle, and whether we have been wise or unwise will be left for discussion.

We classified our chief undertakings as Education, Epidemiology and Laboratory. We sought to instruct the people, to tell them in simple language how single diseases and groups of diseases are transmitted and how the spread of such diseases might be prevented. A chart we used effectively to explain how diseases are transmitted is shown in Figure I.

As a logical complement of education and epidemiology in the pioneer stage, a laboratory is an obvious necessity. It enlists the interest of the practitioner, encourages him to do scientific work, and aids the department in securing prompt reports of communicable diseases. In that workshop, we have adhered to our first principle, we have limited our examinations to specimens for the diagnosis of communicable diseases, and do not examine for non-communicable diseases. Examinations of water samples to determine safety for drinking purposes are made.

Under our law, the Agricultural Department has supervision of

FIGURE I



milk and other foods. We have made only one departure from this principle made necessary by a development discussed later.

Our great handicap at the beginning was that we did not know where diseases were occurring. We had no bureau of vital statistics to give us information as to deaths; we had no reports of cases from doctors. Promptly we organized a system of monthly reporting by sending to each doctor in the state every month a letter in which we called attention to the law requiring monthly reports, and enclosed a return postal card on which were printed the names of the communicable diseases we wished reported.

In this way, we ascertained for the first time the relative prevalence of communicable diseases in the state. These reports were from the first valuable because we could locate epidemics, and make epidemiological studies that decided our original line of chief endeavor.

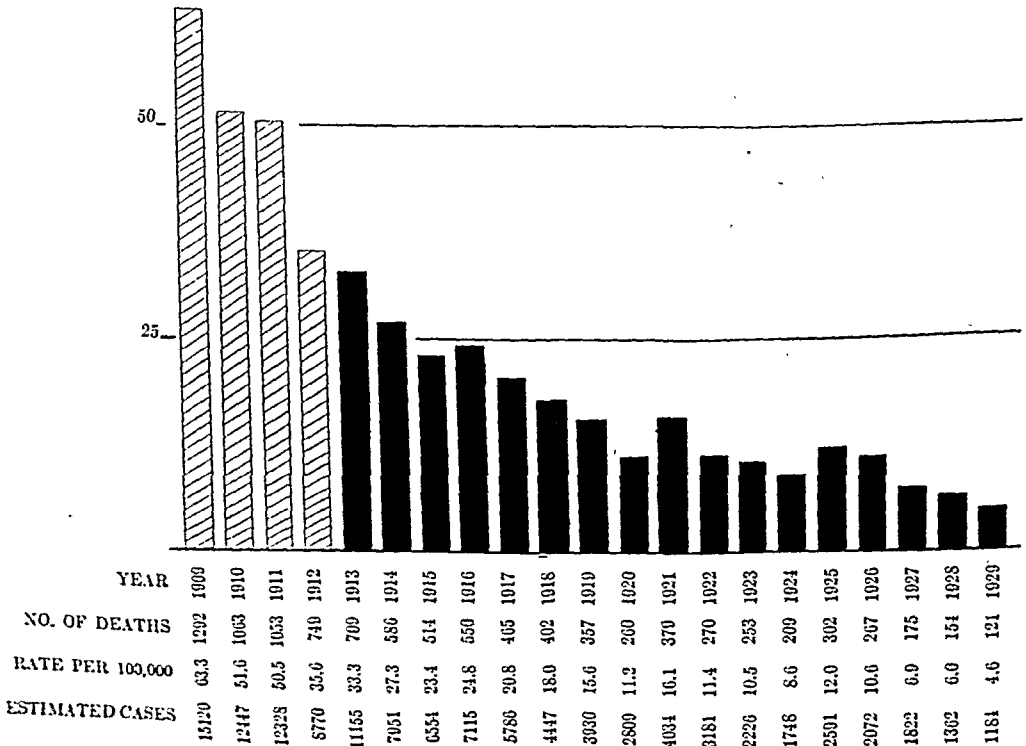
No special study or reports were needed to show that tuberculosis

was a major problem; and the law creating the new health department instructed the board to establish a sanatorium for the treatment of tuberculosis. It might seem that this was in conflict with our principle of considering the public rather than the individual; but our construction of the mandate given us was in line with public health policy. Tuberculosis was a communicable disease and every victim was a potential focus of infection.

With limited funds we decided that we would, so far as possible, restrict patients admitted to the sanatorium to the minimal or moderately advanced classes who would, it is true, be personally benefitted by their stay but who would also be made into public health agencies after leaving the sanatorium. In other words, they would be taught to protect others against any respiratory diseases which they might have, and they would be object lessons to their communities in teaching through example the means of avoiding the transmission of the germs. Furthermore, minimal and moderately advanced cases, mingling more with others, are greater public menaces. Also, the advanced case would be less benefitted and require longer stay at the sanatorium.

FIGURE II

Annual Death Rate from Typhoid, State of Virginia



Our first discovery was that the intestinal diseases, mainly typhoid, were responsible for an undue proportion of sickness in towns and cities—generally throughout the state but especially in the more thickly settled communities. Upon presentation of these facts, the next General Assembly authorized us to employ a sanitary engineer and to begin the systematic protection of municipal and all other water systems supplying the needs of as many as 25 people. This engineer was also charged with the promotion of public sewer systems. Thus began the Bureau of Sanitary Engineering and the state supervision of all public water supplies.

### RURAL SANITATION

In 1912, The Rockefeller Foundation helped to finance a hookworm study in several southern states, including Virginia. Our monthly reports from rural doctors had revealed the widespread prevalence of typhoid fever. The hookworm study showed in many counties an average of 20 per cent infection. These facts suggested the desirability of an accurate sanitary survey of rural homes, of sufficient size to serve as a fair guide to general conditions. So we surveyed 12,000 homes scattered throughout the state and found that 36 per cent of them had no sewage disposal facilities of any sort, and only 0.3 per cent had sanitary sewage disposal. Surely this was sufficient explanation of our typhoid, diarrhea, dysentery, hookworm and other intestinal parasites.

We had already begun the protection of municipal water supplies and the establishment of more municipal sewer systems, and now turned our attention toward the creation of rural sanitation. We established a division of rural sanitation. All public water supplies and public sewer systems have been left under the direction of our sanitary engineering bureau, but private supplies and sewage disposal are under the division of rural sanitation.

### SANITATION OFFICER PLAN

For encouraging localities to undertake systematic sanitation, we devised a plan in coöperation with the U. S. Public Health Service.

Any county that desires to employ a sanitation officer must appropriate \$1,500 annually. To that sum we add \$1,000 and furnish a well trained man to do the work. As his value increases and becomes evident, the counties usually add to their appropriations and, to a certain limit, we increase ours proportionately. This worker, who gets a salary varying from \$1,500 as a minimum to \$2,400 as a maximum, is not a medically trained man but a layman, carefully trained

to do two things—show the people how to construct privies in which sewage will not be accessible to flies or endanger the water supply, and how to protect the water supplies from the contamination of human filth. We find that this work becomes increasingly popular as the years pass; less urging is needed to induce counties to engage sanitation officers; and their work frequently leads to the adoption of a generalized health department.

#### CHILD HEALTH

In 1916, we were asked to survey a rural county to determine the condition of the children. We were rather surprised to discover the large proportion of those with troubles that interfered with their normal mental and physical growth. Before we had reached any conclusion as to methods for solving this problem, the nation was plunged into war. Then the draft boards revealed the alarmingly large number of unfit. We were almost as bad as England in that respect, and conditions in England caused Lloyd George to say that it was impossible to build a Class A Empire out of Class C citizens.

As a natural corollary to our survey and the disclosures of the draft board, we had to begin work for the correction of defects of childhood. This we have been able to do most effectively and without any conflict with the medical profession.

The General Assembly of 1918 passed a law which makes it a prerequisite for obtaining a permit to teach that the applicant must have successfully passed an examination on physical education and physical inspection of school children, on the control of communicable diseases and school hygiene. The course of study is prepared jointly by the Superintendent of Public Instruction and the State Health Commissioner, and is now taught in all teacher training schools and colleges throughout the state and by a correspondence course conducted by the Health Department.

It has been a great factor in promoting popular health education to have over 16,000 teachers scattered through the state, each with some definite knowledge in elementary health matters, each knowing the simple facts in relation to the cause and prevention of communicable disease, each being able to recognize simple physical defects or departures from normality. The inspection work demanded of the teacher is a process which can be undertaken by anyone of good intelligence, if slightly trained. We require only inspection that will determine over or under weight, faulty vision, poor hearing, teeth requiring attention, and such obvious defects of nose or throat as make a child a mouth-breather or victim of frequent colds. This constitutes our 5-point program.



In the work of inspection, the nurse may assist if requested; but her main function is to establish contacts and to secure, if possible, the correction of the defects found. When the parents can pay for corrections, it is usually an easy matter; but when evident poverty prevents, the problem becomes difficult. In such cases, there is usually coöperation between the local health authorities, school authorities, doctors, and the population. The State Health Department will not assume any responsibility for the conduct of curative clinics; but will permit its local representatives to assist in the conduct of such clinics as are operated with the approval of the local health authorities and medical profession and in accordance with the plans approved by the State Medical Society.

For a plan to secure the corrections of dental defects, we requested aid from the State Dental Society. It appointed a committee; and a former president of the society gave up his practice for 6 months during which time he made a careful study of the dental needs of the rural sections, visiting nearly every dentist in the state. He formulated a plan which was unanimously approved by the society, and for 10 years it has been in successful operation. We have a director of oral hygiene who supervises the work and who employs 14 or 15 dentists to look after school children and even younger ones. An extremely moderate charge is made to cover actual costs. The great majority of the children pay though some are unable. If there should be a deficit from the clinic, the state and the locality share equally in the loss.

Few dentists, if any, object to this procedure. They frankly admit that our school clinics are advantageous to them through increasing their adult practice; and furthermore feel that children who have been taught the necessity of care for the teeth are not apt to forget that lesson when they grow up.

It certainly would seem possible for the medical profession similarly to adopt, in coöperation with public health authorities, a program that would encourage medical attention for children and thereby build up a desire for life extension that would cover all ages.

#### MATERNITY AND INFANCY

This problem of child health and welfare was closely associated with another subject, the health and welfare of mothers and infants. In 1912, the General Assembly authorized a bureau of vital statistics, and from the start it was evident that our maternal and infant death rates were unduly high. It seemed to us that these might be lowered by the use of public health nurses, registered nurses who had graduated from accredited hospitals and who in addition had received spe-

cial training in public health work. So, to solve these problems, a bureau of public health nursing and child welfare was established in the health department.

It was evident that mothers needed instruction in the care of themselves and their infants. This could be given by the visiting public health nurse, but her usefulness is necessarily limited. A correspondence course for mothers was begun. We were fortunate in securing as director of this course the wife of a doctor—a mother, and a graduate nurse with public health experience. A course of 12 lessons was planned with the help and approval of members of a committee of the State Medical Society. The popularity of the course is attested by the fact that 2,589 have taken it in 7 years.

But how were we to function without interfering with the private practitioner? We did not want to depart from our principle of limiting our viewpoint to the public versus the individual notwithstanding the definite need for the service; so we asked the organized profession in Virginia, as represented by the Medical Society of Virginia, to appoint committees to coöperate with us in formulating plans and in conducting the work. Later the federal government adopted the Sheppard-Towner plan of aid to states engaging in work for mothers and infants.

Strictly speaking, this as a function of the public health department is debatable, however desirable and popular it may be. However, in states preponderantly rural, especially in those presenting topographical difficulties of intercommunication and economic stresses, the work is justifiable especially when it is so conducted as not to trench upon the legitimate domain of private medicine.

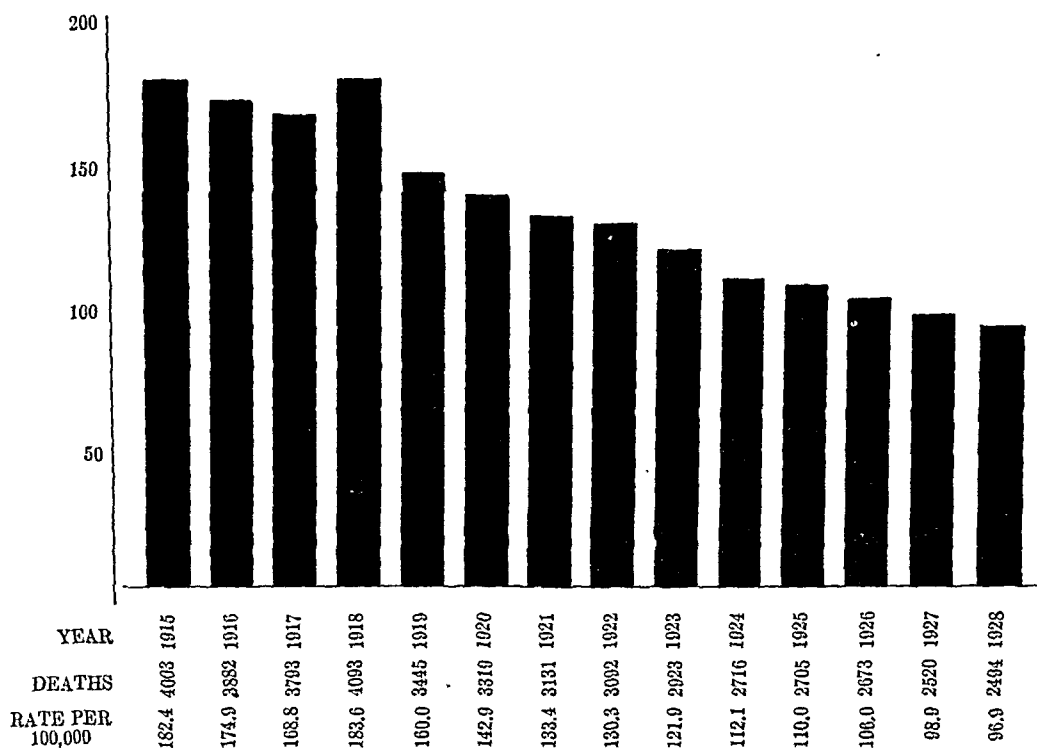
As part of the maternity work, we endeavor to exercise control over midwives. It is not so effective as we would wish, but it is becoming more so. When we began supervision and instruction of these women there were about 9,000 midwives in the state; there are now less than half that number practising. We have a state director of midwifery instruction, and she personally or through nurses has trained and given instruction to classes in 85 counties. Local midwives are required to attend those classes; and the ignorant ones soon drop out. We have not endeavored to fix standards for midwives. They constitute a problem which we do not feel entirely competent to solve. Our doctors admit the necessity for them while deploring their lack of training. We, therefore, have followed the advice of the profession and confined our eliminations to the glaringly unfit.

There is one laboratory operation which could not by itself be regarded as a public health endeavor, yet we have to undertake it as part of a program. Having adopted a plan for maternity work. we

have had to consider prenatal conditions, and do urinalyses when samples are sent by our nurses for midwife cases. This enables the nurses to assure medical care for those mothers who need it, and many who might have risked their lives with midwives have, by this method, been placed in time under the care of physicians.

FIGURE III

Annual Death Rate from Tuberculosis, All Forms, State of Virginia



#### TUBERCULOSIS CONTROL

I have mentioned the establishment of a tuberculosis sanatorium, during our first biennium. We now have 3 of these institutions, 2 for white people and 1 for colored. We have still further extended our work for the tuberculous. Years ago it became obvious that only a small proportion of the tuberculous in Virginia could be provided with sanatorium care, so we inaugurated a system of case finding clinics and out-patient service. Again we were assured sympathetic coöperation on the part of the medical profession.

We have two traveling clinics, each consisting of 1 doctor and 4 nurses. Each doctor spends 1 week in a county and each nurse spends 4 weeks. The nurses visit all doctors in the county, find contacts, advertise and arrange the clinics, assist the clinician while he is in the county, and after the clinic it is the job of the nurse to induce all positive or suspected cases to go to their family physicians. All local

doctors are invited to take part in the clinic. The findings of the clinician are reported to the family physician.

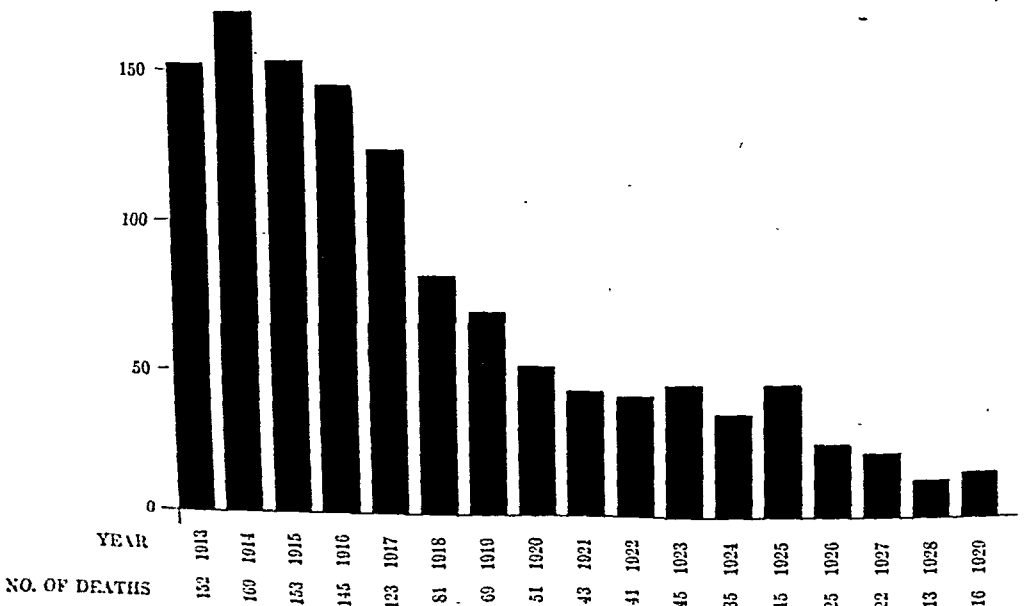
Although the Medical Society of Virginia approved our method of conducting case finding clinics, we never go into a community unless we have previously secured the approval of the local doctors. At first, some of these demurred, taking the ground that our clinics were a reflection on their skill in diagnosis; but, as patients not under a doctor's care began to visit the doctors, this opposition waned and the clinic service came to be most welcome. Doctors in some localities have taken such interest in the work that we have been able to leave clinics in their hands. That would be an ideal for the whole state if it could be realized.

VENEREAL DISEASE

During wartime, the federal government began a determined fight against the venereal diseases; conducted a number of free clinics for treatment; and aided financially in law enforcement and educational measures. When it withdrew its allotment of funds, these local free clinics closed and law enforcement ended so far as the state's responsibility was concerned. Recognizing venereal diseases as matters of public health interest by reason of their communicability, we felt that educational propaganda would be justified. This has consisted of lectures and the distribution of literature on sex education.

FIGURE IV

Annual Death Rate from Malaria, State of Virginia



Even in this limited field we were not entirely satisfied that we were justified; so we addressed letters to all college presidents in Virginia and to all division superintendents of schools asking for opinions as to the value of the work as conducted, and whether, if worth while, it should be continued under the Health Department or the Department of Education. So many answers indicated a preference for the Department of Education, and this so coincided with our views, that we asked the General Assembly of 1930 to reduce its appropriation to us to be used for this work.

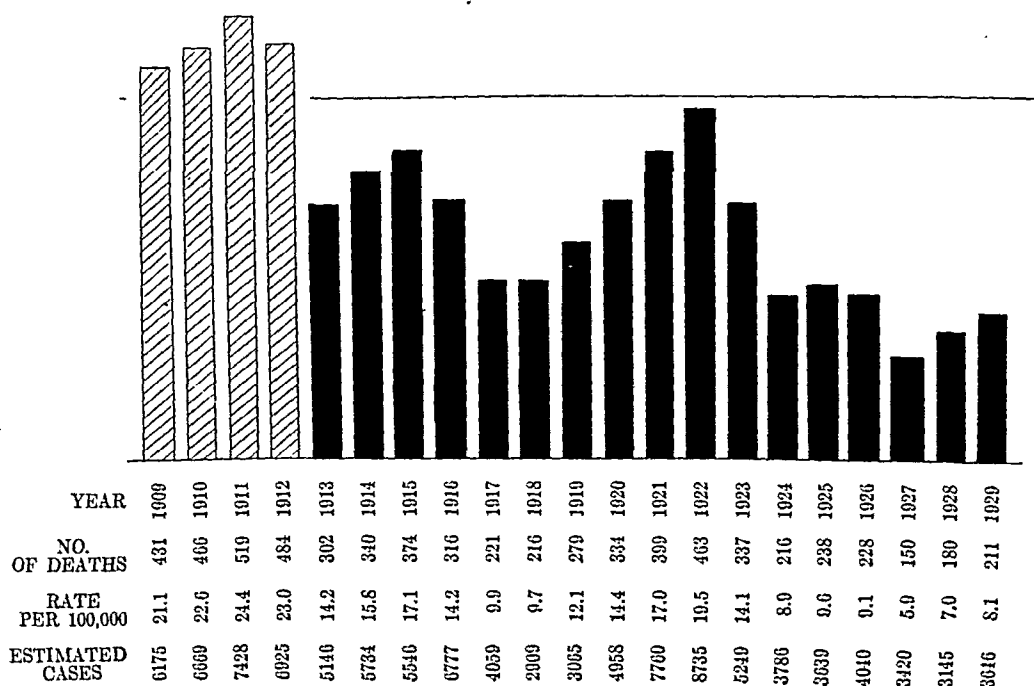
A large part of our laboratory examinations has, however, to do with venereal diseases. We do more than 30,000 Wassermanns each year and a large number of examinations for gonorrhea. This work probably requires no excuse as a public health activity, though at one time private laboratories did object. The subject was discussed at an annual meeting of the State Medical Society and, by a practically unanimous vote, the society requested us to continue this service to the doctors of the state.

#### MALARIA

We have naturally developed our epidemiological work as the years have passed and have undertaken some definite campaigns as a consequence. For instance, for several years we made a strenuous

FIGURE V

Annual Death Rate from Diphtheria, State of Virginia



campaign against malaria in sections which showed a continuing and large prevalence. Malaria has virtually disappeared as a cause of death. To what extent that has been due to our efforts or to influences unrecognized by us, I do not presume to say; but the reason for intensive and strenuous work having ceased, we are not now paying as much attention to malaria. We have many notable instances where a long standing and extensive prevalence of severe malaria disappeared under the strenuous, well directed anti-malaria measures conducted by the United States, state and local agencies.

#### DIPHTHERIA

Three years ago we immunized about 200,000 children; or, to be more exact, we gave toxin-antitoxin to that number. Our death rate from diphtheria made an immediate and most satisfactory decline in face of a higher rate that year for the nation as a whole. Since then we have more nearly approximated the national curve, which indicates a necessity for a second campaign.

#### OPPORTUNISTS

I mention these instances to show that we have been opportunists, doing the work which seemed most timely and necessary, dropping special campaigns when they seemed to have accomplished their purposes, returning to them if later it should seem necessary. We may again have to work intensively against malaria. Although our succeeding General Assemblies have been increasingly appreciative of health work, and our appropriations have grown from the modest first appropriation of \$40,000 to somewhat over \$1,250,000 for the biennium beginning July 1, 1930, we still have to consider carefully our expenditures in the light of immediate needs.

Virginia, following the lead of the federal government, placed in the Department of Agriculture the supervision of dairies and food. This arrangement was in force before the State Health Department was recognized in 1908. While in principle I believe a state health department should have supervision of dairy and food products as in cities, in practical operation we have had fine coöperation with the officials of this department and I believe the public health is efficiently safeguarded by the present arrangement.

In 1927, the sanitation of shellfish handling and production was placed with the health department. A floating laboratory is maintained for testing the pollution of growing beds, inspection is maintained of shucking plants and the personal hygiene of the workers. Furthermore, there is steady effort made to bring about sanitation in

the whole oyster producing area that all the filth-borne diseases will disappear.

### CONCLUSION

I have given in bald outline the major steps in the development of health work in my state. In conclusion, I ask you to consider the activities of health work for which public funds are appropriated. These may be roughly divided into:

- Prevention of disease
- Promotion of health
- Cure of disease

With the last we are not concerned. We are directly concerned with the first, and we have a considerable interest in the second, the responsibility for which we divide with the medical profession.

To illustrate our interest in the first division, we might define the subject as embracing health education; sanitation, which would include excreta disposal, protection of water supplies, the guarding of milk and foods, the control of flies, mosquitoes and other germ-carrying insects; personal prophylaxis, such as vaccination against small-pox, diphtheria, typhoid or any disease for which we may find a reasonably successful immunizing agent; epidemiological work for either study or control; laboratory; and vital statistics. Surely no one can dispute our interest in these subjects and our right to work in these fields.

Promotion of health I take to include maternity and infancy welfare, instruction and practice in physical inspection of school children, school hygiene and correctional clinics. I am not including in this list tuberculosis clinics as conducted by us—they are in effect helping in diagnosis of communicable disease—but I would include periodic examination of adults, not as something to be undertaken by us but as something to be encouraged by all health workers. So far as other divisions are concerned, I have told how they operate in Virginia; and they are open for discussion.

It seems to me that under the classification, "Promotion of Health," we find our twilight zone. Any effort in these lines may easily become obnoxious to the profession; and we cannot hope to gain in popularity, esteem or results, if we align the medical profession against us. All activities in this classification should be developed with the approval of the medical profession and carried on with the coöperation of the doctors. It is always well to consider the undeniable fact that, when we plan to enlarge our fields of usefulness,

we should be sure that, in striving for wider areas, we do not risk the area we occupy.

When developing full-time health service in rural sections, we recommend, as the first step, the employment of a sanitation officer, whose entire time shall be devoted to the securing of sanitation and to the protection of individual water supplies. Our second recommendation is the employment of a public health nurse, who serves principally in maternity instruction, in teaching infant care and looking after children in the schools. We do not recommend a full-time medical health officer until these lay workers have been assured, for unless he has these workers to aid him he is not apt to justify the cost of his employment; and, so we insist, that when a medical health officer is employed, he shall have these lay assistants.

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## Investigation of Infant Mortality in Brazil

A REPORT on the investigation of infant mortality in Brazil, made under the auspices of the Section of Hygiene of the League of Nations, was recently published.

The investigation was made in 8 districts, some urban, others rural, and was concerned with 7,379 live births, mostly in poor families. The infant mortality rate varied according to the district from 96 to 201 per 1,000 live births. The lowest rate, 96, was obtained in a prosperous town, where living conditions and sanitation were satisfactory; there was also in that town a health center maintained by the Government and doing prenatal and child welfare work, and a clinic for venereal diseases. The highest infant mortality rate was obtained in a rural district where the inhabitants were very poor, and the conditions of sanitation were very unsatisfactory.

More than one-half of the children studied died before the end of 3 months, and almost one-third of all deaths were caused by diseases due to nutritional disturbances. It was found that while 40 per cent of the children were fed at the breast, of those who died of nutritional disturbances only about 13 per cent were so fed.

It was also noted that the care given to the mothers at childbirth and to the child improved with the improvement of the economic situation of the family.—*Archivos de Hygiene*, Publicação do Departamento Nacional de Saude Publica, Rio de Janeiro, 1930, No. 2, p. 61.



# Incidence of Partial Paralysis\*

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IN March the attention of the Tennessee State Department of Public Health was called to the occurrence of a number of cases of a condition which, for want of a better term, has been called "partial paralysis." A number of other terms have also been applied such as "peripheral polyneuritis," "toxic polyneuritis," and "Jamaica ginger paralysis." Terms in common usage have been: "Jake leg," "Jake foot," "Jake hop," and "Jake paralysis."

So far as our information goes, cases have been reported in greater numbers in the southern states, especially Mississippi, Alabama, Georgia, Oklahoma, Tennessee and Kentucky.

The experience with regard to the cases occurring in Tennessee is the basis for this paper. There have been gathered more or less complete histories from 208 cases. This in all probability does not indicate the true extent of the condition, as many cases have occurred without being seen by any physician. Information gathered in the areas of greatest prevalence in Tennessee leads to the assumption that only about two-thirds of the cases have been reported. Of the 208 cases, 185 were from 4 counties, Washington, Carter, Sullivan and Unicoi, which are contiguous and located in the extreme northeastern section of the state, the greatest number being from the 2 counties first mentioned—Washington with 120 cases, and Carter with 52 cases. However, scattered cases were reported from 8 other counties.

## SYMPTOMS

The first thing noted in the majority of cases was weakness of the feet. This was followed by soreness in the calves of the legs, and tenderness over the calf muscles on pressure. In a few instances a history of an antecedent acute infection was elicited, such as sore throat, coryza, or symptoms suggesting an infectious onset such as chill, fever, general body aching, and headache. This appears to have been coincidental. There occurred in some cases premonitory symptoms of soreness in or quivering of the calf muscles.

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\* Read before the Epidemiology Section of the American Public Health Association, at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 29, 1930.

Paralysis of the lower extremities reached its maximum extent in from 2 days to 1 week. Those patients showing involvement of the fingers, hands or wrists, stated that these members did not develop weakness until from 3 days to 1 week after the time of onset of weakness in the feet.

When questioned, the patients complained of coldness of the affected extremities, and many complained of numbness and tingling. The latter symptoms were frequently transient, existing only for 24 to 48 hours. Only 1 complained of anesthesia over the feet. There were no cranial nerve symptoms in any patient, and no history of sphincter disturbance.

#### NEUROLOGICAL EXAMINATION

The following is quoted from reports of Dr. Hugh J. Morgan, Professor of Clinical Medicine, Vanderbilt University, opportunity having been afforded him to see and examine some 15 cases.

*Gait*—The gait is the typical steppage gait of peripheral neuritis with dragging toes and flail-like tapping of the feet. Patients use canes or crutches and constantly hold to some object, walking from wall to chair, to bed, etc.

*Trophic Disturbances*—The affected members are invariably cold and wet with perspiration. Cyanosis of the affected members was present in a few, and 1 girl showed slight edema of the affected feet. This same patient showed over the shins and feet a diffuse erythema with a few papular erythematous lesions interpreted as trophic. All complained that the affected members were cold, and this, together with the sweating, was the most striking vasomotor change.

*Motor Changes*—Complete or partial paralysis of the muscles of the flexors and extensors of the toes and feet were the most constant findings. Dorsal flexion of the toes and of the feet was constantly impaired. In some cases plantar flexion of the toes and feet was not completely absent, even though complete paralysis of the opposing muscles was present. Weakness in the flexor and extensor muscles of the leg was seen, but in fewer numbers, and no complete paralysis of these groups of muscles was noted. Two cases showed involvement of the thigh muscles.

In the upper extremities the first muscles affected seemed to be those of the thumb and first finger, although complete extensor paralysis of the fingers was common. Extensor paralysis or weakness of the wrists was also almost invariably present when the upper extremities showed any involvement at all. Patients were also seen who showed involvement of the fingers and wrists, although these were less numerous. About half of the patients showed some involvement of the upper extremities, whereas all of them showed lower extremity involvement.

Motor cranial nerve involvement, or involvement of the trunk muscles, was not observed in any patient.

*Sensory Changes*—Mild subjective sensory disturbances were complained of by many patients. Demonstrable sensory changes were noted in relatively few. Two patients were seen showing a stocking type of anesthesia over the lower extremities. One of the Vanderbilt Hospital cases has shown the glove type of anesthesia of the upper extremities.

Most of the patients complained of tenderness on pressure over the calf muscles. No definite tumefactions were felt along the course of any of the peripheral nerves.

*Reflexes*—Absent ankle jerks was a constant finding. Not a single case showing absent knee jerks or absence of the deep reflexes of the upper extremities was seen. The cremasterics and abdominal reflexes showed no constant change. In cases closely questioned there was no history of any disturbance of visceral reflexes (bladder, rectum).

*Cranial Nerves*—A complete examination of the cranial nerves (including ophthalmoscopic examination) was made in 9 cases with negative findings.

Clinical descriptions and reports of cases in other areas are to be found in publications by C. R. Bennett,<sup>1</sup> and S. Harris.<sup>2</sup>

#### TENNESSEE EXPERIENCE

The State Department of Public Health was first advised of the development of these cases on March 8, 1930. Staff members were immediately sent to assist the local full-time health officers in an investigation. Epidemiological case cards were completed for all cases that could be located. It was immediately apparent that a decidedly strange age and sex distribution had occurred when comparison was made with the conditions of a communicable nature. No case had occurred under the age of 15 years; 79 per cent of cases were in the age group 20 to 45 years. Of the total 85 per cent were males. Such a distribution could not be compared with any infectious condition with which previous experience had been had. Such a distribution might occur as a result of exposure of certain occupational groups to the causative agent.

Many types of occupation were represented, as follows: 67 were laborers of various kinds, 23 of these being in artificial silk manufacturing plants, this being the main industry of Elizabethton; 19 were clerks; 17 were classed as housewives; 14 were merchants; 11 were farmers; 10 were cooks; 8 were mechanics; 6 were carpenters; 2 were contractors; 2 were plumbers; 2 were brick masons; 2 were policemen; 2 were physicians, and 1 each was listed as: lawyer, salesman, painter, barber, cobbler, postmaster, optician, schoolboy and "bootlegger." With such a wide diversity of occupations it was readily apparent that there could be no explanation of the occurrence of the cases as a result of any occupation or occupational condition.

Thirty-three per cent of cases were classed as in poor, 62 per cent as in moderate, and only 5 per cent in good economic circumstances.

The occurrence of cases in various areas at the same time, and the peculiar distribution of sex and age excluded the possibility of the causative agent being contained in some common vehicle such as water, milk, ice cream, or some other food.

It was apparent that the causative agent became effective in adult age groups, and to a greater extent in males than in females, and involved a higher proportion of persons in moderate or poor economic circumstances. It was reasoned that this was due to greater exposure in these groups.

Inquiry was made as to the use of alcohol containing preparations. Only 4 persons (less than 2 per cent) denied the use of such preparations. Two of these were said by other persons to be known to use alcohol. It is evident that in certain cases admission of the use of alcohol would be difficult to obtain. Seventy-two per cent of those admitting the use of alcohol also gave a history of the use of fluid extract of Jamaica ginger. It is quite possible that others used Jamaica ginger without being aware of it, as it seems to have been the practice of some liquor dispensers to add this product, believing that a more potent compound was the result.

The fluid extract of Jamaica ginger used was not confined to the product of any one distributor, nor to one particular brand. According to labels and samples collected from various sources, Jamaica ginger of a variety of brands had been used. This product seems to have been readily available at smaller grocery and drug stores, was relatively less expensive than certain other alcohol containing preparations, leading to the term applied by some, "the poor man's drink," as it could be obtained in small quantities, and with consequently less outlay of funds. It was thought by some users that this product gave a quicker reaction with less after effects. The burning sensation to mucous membranes was overcome by dilution with water or soft drinks of various kinds. Some persons, however, stated that the material was used without dilution.

The history as to the time of last using alcohol was obtained in as many instances as possible. In the case of more or less constant users, this information was not of much value. From certain other individuals, it is evident that no great reliance could be placed on the information obtained, as the date could not be fixed with any degree of accuracy. However, 53 per cent of cases stated that the time of last using alcohol before appearance of paralysis was between 1 week and 1 month previously, 32 per cent stated it was less than 1 week, and 15 per cent that it had been more than 1 month.

There appeared to be no relation between the amount of the fluid extract of ginger consumed and the severity of symptoms. Apparently small amounts in some individuals produced the same result as very much larger amounts taken by others. It seems safe to assume that the paralysis did not occur in all persons exposed to the causative

agents. Apparently reliable histories were obtained in which it was noted that of several persons, members of the same party, and exposed in essentially the same manner and degree, some subsequently developed the paralysis and others did not.

The date of onset was obtained as accurately as possible. Seventy-two per cent of cases had an onset within the first 10 days of March, 21 per cent before, and 7 per cent after this period. All but 3 had an onset within a period of 30 days.

Taking into consideration all the data at hand, it seemed reasonable to assume that the cause of this condition was closely associated with the use of alcohol, and the evidence pointed very strongly toward the probability of one alcohol containing product, namely, fluid extract of Jamaica ginger, being the vehicle involved. It should be emphasized, however, that neither alcohol of itself nor the standard fluid extract of Jamaica ginger was considered as a causative agent, but rather that the sub-standard fluid extract acted as the vehicle by which the actual causative agent was enabled to enter the human mechanism.

#### FURTHER PROGRESS OF CASES

The further progress of these paralytic cases has been watched with a great deal of interest, by practicing physicians, public health officials, and the lay public. Opinions differ as to the prospect of complete recovery, and the progress made toward this hoped for outcome. An opportunity for the study of the pathology of the condition was afforded by necropsy following the death of one individual from intercurrent causes. This was reported by Dr. Hugh Jeter.<sup>3</sup> Briefly summarized, the results of the preliminary examination were the finding of a definite lesion of the peripheral nerves and no evidence of any such lesion of the cord or brain. This consisted of a perineural exudate composed largely of lymphocytes, many of which were large; a few scattered polymorphonuclear leukocytes; many red cells, and a slight amount of fibrin. This perineural exudate was stated to be most certainly an acute process limited to the peripheral nerves, and in patches along the nerves. No microorganisms could be demonstrated in the exudate, nor was there evidence of any acute chemical poisoning.

Some observers are of the opinion that definite but very slow improvement is being noted, while others believe that the seeming improvement is due to the education of other muscles to take over in part the functions of those whose nerve supply has been disturbed. Certainly the progress toward recovery is very slow. No complete recoveries have been reported, notwithstanding the fact that more than 6 months have elapsed since the development of the paralysis.

## LABORATORY STUDIES

A plan of study from a laboratory standpoint was projected by the Tennessee Department of Public Health in coöperation with the Vanderbilt University School of Medicine. The results of this study will be available at a later date.

A preliminary report by Dr. Maurice I. Smith<sup>4</sup> and others from the National Institute of Health (Hygienic Laboratory) of the U. S. Public Health Service indicates through pharmacological and chemical studies that the cause of this unusual type of paralysis is probably a phosphoric acid ester of tricresol. Further experimental work is being carried out along these lines at this institution.

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## National Association of Juvenile Courts

IN compliance with a resolution passed at the International Child Welfare Congress held in Paris in 1928 and calling for the organization of an International Association of Judges of Juvenile Courts with national organizations within each country, a royal decree issued by the King of Spain on May 16, 1930, provides for the organization of a National Association of Juvenile Courts in that country. Among the purposes of the organization the decree mentions the study of questions relating to the work of the juvenile courts, promotion of coöperation between these courts, work for the establishment of new juvenile courts, training of the staff of the juvenile courts and investigation of matters relating to the work of these courts.

# Agglutination Tests for the Diagnosis of Undulant Fever\*

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IT seems obvious that coöperative investigations by public health laboratories in a state should add interest to the work of the laboratories, increase the solidarity of their association, and yield results of general value. A statement of the ideal, however, does not remove the difficulties which lie in the path of such an undertaking. The selection of a topic of sufficient interest to all members of the association, the choice of work which lies within the capacities of the individual laboratories to perform, and the arrangements for a central office for the supply of materials and information and for the collection and handling of the reports of results, are important details to be arranged outside of any solution of the problem under investigation.

In order to find out whether the independent laboratories of the New York State Association of Public Health Laboratories could carry through a coöperative investigation and derive the expected benefit from the effort, it was decided by the association, in 1928, to embark upon a joint enterprise in 1929. The topic chosen for investigation was "Agglutination Tests for the Diagnosis of Undulant Fever." Although this topic was not original, it was timely.

The plan was to use for these tests specimens of human serum received at the laboratories for any sort of examination. It was thought that by making agglutination tests with these serums and a suspension of *Brucella abortus*, positive results would be obtained in cases in which undulant fever had not been suspected, as has been the experience elsewhere during the past few years in which many previously unrecognized cases of undulant fever have been uncovered by means of routine agglutination tests.

It was hoped that these tests would give some information as to the incidence of undulant fever in different parts of New York State and it was expected that tests with serum from patients suffering with

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\* Report of a Coöperative Investigation by Members of the New York State Association of Public Health Laboratories during 1929.

a great variety of diseases would throw additional light upon the specificity of the reaction.

The coöperative investigation was conducted according to the plan from January 1 to December 31, 1929. The following is a report of the methods used and of the outcome of the work.

As this report deals primarily with an enterprise of the New York State Association of Public Health Laboratories, a general review of the literature on undulant fever in this country has not been included in it. Extensive bibliographic reference to the important and well known work which has been done on this subject in the past few years was thought to be unnecessary here, as excellent reviews of this work are generally available.

#### METHOD

The offer of the Rochester Health Bureau Laboratories to serve as headquarters for this investigation was accepted and during the year all correspondence and supplies of materials were handled through the office of those laboratories. After consultation with the State Laboratory, a standard procedure was adopted for the agglutination tests. Letters were addressed to 57 approved laboratories throughout the state inviting them to take part in this investigation. Of these, 21 indicated a willingness to join in the enterprise. The number, however, was reduced by various circumstances to 17. Table I gives a list of the laboratories in which the work was carried out during the year. In these, 3,716 specimens of serum were tested for agglutinins for *Brucella abortus*. The location of the laboratories and the location of cases with positive agglutination reactions are shown on the accompanying map (Figure I). As will be seen from an inspection of the table and map, the coöperating laboratories were well scattered throughout New York State.

#### PROCEDURE

The antigen was supplied in 100 c.c. bottles. Agglutinating serum for repeated controls of the sensitivity of the antigen was supplied in 1 c.c. vials. These materials were sent out with the following description and rules for performing the tests:

*Antigen*—The antigen is a saline suspension of a culture of *Brucella abortus*, Strain No. C209, obtained from the New York State Laboratory at Albany. This strain was originally isolated from cow's milk. The organism was grown on glucose meat infusion agar pH 7.4, washed off with saline solution and killed by heat at 60° C. for 1 hour. The suspension was diluted with 0.85 per cent NaCl solution containing 0.1 per cent formalin to match in density a No. 3 barium sulphate stand-



ard. Before using the antigen, shake up the suspension thoroughly. Control agglutination tests with this antigen have been satisfactory.

*Anti-abortion Serum*—This vial contains 1 c.c. of diagnostic agglutinating serum for undulant fever. This serum is to be used as a control for the agglutinability of the antigen suspension of *Brucella abortus* in each day's series of tests.

This serum is now diluted with an equal amount of 50 per cent glycerin. For the control test use a final dilution of 1-400.

Add 1 c.c. of this glycerinated serum to 99 c.c. of salt solution containing 0.5 per cent of phenol. This gives a dilution of 1-200. Use 0.3 c.c. of this dilution in the control test.

This diluted serum should keep satisfactorily in the icebox for 6 months or longer.

*Procedure*—1. Use 0.3 c.c. amounts of serum diluted 1:5, 1:10, 1:20, 1:40, 1:80, 1:160. The final dilutions when equal amounts of culture suspension are added will be double these (e.g. 1:10 through 1:320). In case agglutination is obtained in the 1:320 dilution, test higher dilutions of the serum in order to determine the titer.

2. Use two control tubes, one containing 0.3 c.c. of saline plus 0.3 c.c. of antigen to make sure that the suspension remains homogeneous, and one containing 0.3 c.c. of a known agglutinating serum plus 0.3 c.c. of antigen. Check up the agglutinability of the suspension.

3. Use 0.3 c.c. of the antigen culture suspension in each tube.

4. Use tubes measuring 11 by 75 mm.

5. Fresh or inactivated serum may be used.

6. *Incubation*—Incubate the mixtures for 2 hours at 37° C. Record the reactions. Place the tubes in the icebox over night and record the results.

7. *Recording of reactions*—Read the tests in the morning and record the degree of agglutination as follows: 4 + = complete agglutination, supernatant fluid clear, all large clumps; 3 + = supernatant fluid clear or nearly clear, very definite clumping; 2 + = supernatant fluid not clear, definite clumping; + = supernatant fluid not clear, very small clumps definitely visible to the unaided eye; — = suspension uniformly turbid, no clumping.

All laboratories are requested to follow this procedure, which is based upon the *Standard Methods of the Division of Laboratories and Research of the New York State Department of Health*. If a different procedure is being followed in your laboratory, please do the test by both methods when possible and record the results of both tests for comparison.

*Records*—Printed cards with headings and spaces for notations are being sent to you. Please give all the information asked for on this card and add any additional appropriate information. It is requested that all records for the association be kept on these cards to secure uniformity and facilitate compilation. Cards may be returned periodically or at the end of the year.

Various comments were received on the antigen. Dr. Charles Carpenter found this suspension less agglutinable than the living cultures which he has used in his work. Undoubtedly it was not a highly sensitive antigen. Its sensitivity, however, was apparently sufficient to give good results in cases of undulant fever and probably reduced

the number of weak reactions without loss of diagnostic precision. Its keeping qualities were excellent, as it lost none of its sensitivity during a year. In the tests it served as well as a suspension of *Brucella melitensis* from true malta fever in man, which was used by the State Laboratory in a number of agglutination tests made in parallel with those using the suspension of *Brucella abortus* C209. The usual type of agglutination clumps obtained with this antigen was finely granular. The clumps formed slowly during the 2-hour period of incubation at 37° C., and were not readily visible until the tests had been allowed to stand for 18 hours in the icebox at about 4° C.

The immune serum used as a positive control was obtained in several ways: 1. Abortus serum prepared at the State Laboratory at Albany by immunizing rabbits against *Brucella abortus*. 2. The mixture of the serums of rabbits immunized against *Brucella abortus* and *B. melitensis* prepared in this laboratory. 3. Serum from patients with undulant fever containing agglutinins for *Brucella abortus*. All of these serums had titers greater than 1-2,000 for the strain of *Brucella abortus*, C209, used in these tests. The rabbits were immunized by subcutaneous and intravenous injections of suspensions of killed *Brucella abortus*.

To provide for all use made of the reagents, 5,500 c.c. of antigen suspension were supplied and 33 vials of agglutinating serum were sent out.

#### RESULTS

Agglutination produced by a 1-100 dilution of the patient's serum was considered diagnostic or positive for undulant fever in this investigation. Of the 3,716 specimens reported upon, 64 gave agglutination in a titer of 1-100 or higher. The percentage of positive reactions in this series was, therefore, 1.72 per cent. Agglutination in some dilution of the serum, from 1-10 up to 1-10,000, was given by 165 or 4.44 per cent of the 3,716 specimens. With the exception of serums from two "old cases" of undulant fever, whose titers were 1-80, no specimen giving agglutination in a dilution less than 1-100 seemed to come from a case of undulant fever. These results are summarized in Table I.

In 10 cases of typhoid fever, the serum gave agglutination with the abortus antigen in 1-10 to 1-40 dilutions. On the other hand, 180 specimens from patients suspected of having typhoid fever were entirely negative. It is probable that an undetermined number of these patients actually had typhoid fever. These results bearing on the specificity of the agglutination reaction for the diagnosis of undulant

TABLE I

RESULTS OF AGGLUTINATION TESTS FOR UNDULANT FEVER  
 COÖPERATIVE INVESTIGATION BY NEW YORK STATE LABORATORY ASSOCIATION  
 January 1 to December 31, 1929

Laboratory	Positive Agglutination Reactions					
	in dil. 1-100 or more	in dil. less than 1-100	<i>B. meli- lensis</i> only 1-20	False Pos.	Negative	Total Tests
1. Binghamton State Hospital Binghamton	1				1	2
2. Buffalo City Hospital Buffalo	1				5	6
3. Buffalo Health Department Buffalo	4	2		3	228	237
4. Cattaraugus County Lab. Olean	3	6			89	98
5. Cayuga Co. Bact. Lab. Auburn					6	6
6. Letchworth Village Lab. Letchworth Village					41	41
7. Merkel Memorial Laboratory Plattsburgh	1				129	130
8. Montgomery County Lab. Amsterdam					41	41
9. New Rochelle Hospital Lab. New Rochelle					270	270
10. New York State Laboratory Albany	34	36	8	1	687	766
11. Otsego County Lab. Cooperstown					93	93
12. Rochester Health Bureau Lab. Rochester	7	27			1,027	1,061
13. St. Joseph's Hospital Lab. Elmira		3			64	67
14. Steuben County Lab. Corning	6	1			12	19
15. Utica City Lab. Utica	2	8			293	303
16. Warren County Lab. Glens Falls	4	3			440	447
17. Yonkers Bureau of Labs. Yonkers	1	7			121	129
Totals	64	93	8	4	3,547	3,716

Pos. 1-100 or more 64 = 1.72 per cent  
 Pos. in any dil. 165 = 4.44 per cent

fever have significance in connection with the large amount of negative evidence included in the reports received during this investigation. The report cards listed 95 different clinical diagnoses, including most of the infectious diseases and many obscure febrile conditions. Among these reports of specimens giving negative undulant fever agglutination

tests, there were listed 126 cases of syphilis, 55 cases of pregnancy, 10 cases of abortion, 15 cases of pelvic-inflammatory disease, 33 cases of pneumonia, 20 cases of arthritis, 31 cases of tuberculosis, 46 cases of cardio-renal disease, and 16 cases of enteritis. The great variety of conditions in this series in which no agglutinins against the abortus organism were found indicates that this agglutination test has a relatively high degree of specificity.

False reactions were occasionally obtained with serum containing hemoglobin. The experience of Dr. C. A. Bentz, in Buffalo, and of those at the State Laboratory at Albany, indicates definitely that "hemolized serums" may give false reactions in dilutions as high as 1-320. Two such cases were carefully investigated by Dr. Bentz. These specimens were from patients with typhoid fever. In these cases the agglutinin titer was 1-320 with specimens of serum showing the results of hemolysis. Two days later, specimens free from hemoglobin, from both of these patients, gave absolutely no agglutination. From this experience, it is evident that positive agglutination in hemolized serum should not be accepted as diagnostic until confirmed with serum free from hemoglobin.

Of the 64 "positive cases," one originated in Pennsylvania. The remaining 63 were distributed throughout the following 28 counties of

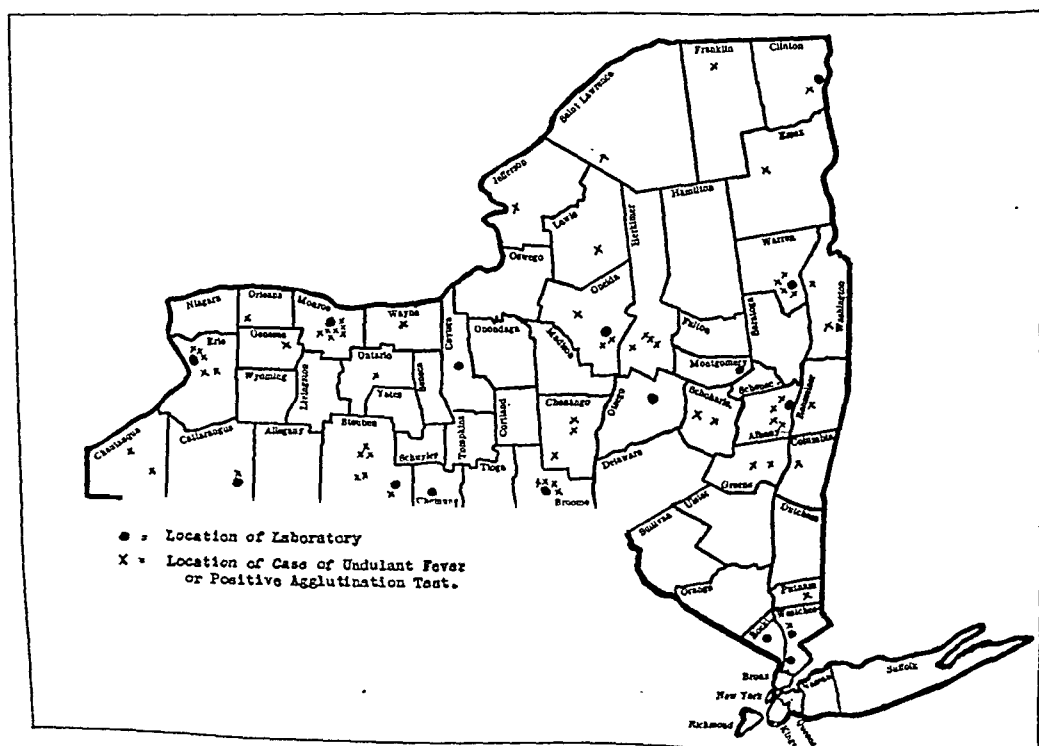


FIGURE I

Base CLEARTYPE map, copyright,  
American Map Co., New York

New York State: Albany, 4; Broome, 4; Cattaraugus, 1; Chautauqua, 2; Chenango, 3; Clinton, 1; Columbia, 1; Erie, 5; Essex, 1; Franklin, 1; Genesee, 1; Greene, 2; Herkimer, 4; Jefferson, 1; Lewis, 1; Monroe, 7; Oneida, 3; Ontario, 1; Orleans, 1; Putnam, 1; Rensselaer, 1; Saint Lawrence, 1; Schoharie, 2; Steuben, 6; Warren, 4; Washington, 2; Wayne, 1; Westchester, 1. While there are undoubtedly foci of undulant fever in New York State, this survey is inadequate to indicate their location. It suggests, however, that there may be an unusual prevalence of the disease in the counties of Monroe, Albany, Broome, Warren, Erie, Steuben, and Herkimer. In most of these counties, the presence of a large laboratory engaged in active investigation may be responsible for the greater number of tests and therefore a greater number of positive findings. In view of this and other possibilities, it would be unwarranted to use these statistics for more than they purport—namely, a location of patients whose serums give positive agglutination tests for undulant fever.

The age group distribution of patients in this series from whom serum was obtained giving positive agglutination reactions with *Brucella abortus* is much the same as that found in other similar investigations. Most of the positive reactors, 53 per cent, were in the age group 15 to 39 years. No children in the first year of life and only 1.6 per cent of children under 10 years of age gave positive reactions. As the specimens were drawn largely from adults, it is not justifiable to accept this difference as indicating the actual difference in incidence of the disease in persons in these age groups. Nevertheless, the conformity of these figures with those of others who have studied this problem is noteworthy. Undulant fever in this country is undoubtedly most common in adolescents and young adults.

More males than females gave positive reactions. The percentage of males (65.8 per cent) was twice that of the females (32.8 per cent). While no statistical studies have been made to determine the correlation of positive reactors according to sex with the proportions of the sexes in the whole series, it can be stated that there was no great excess of males among those from whom the specimens were taken. This higher incidence of positive reactions among males has been brought out repeatedly in studies of the incidence of undulant fever.

Among the occupations of the patients whose serums gave positive agglutination tests, farming was the one which was most often associated with undulant fever. Farmers and their wives made up 23.2 per cent of those who gave positive reactions. The incidence among those on farms is in fact somewhat higher than this, as a number of others who followed a principal occupation other than farming lived on farms.

TABLE II

DISTRIBUTION ACCORDING TO AGE, SEX AND OCCUPATION

	Per Cent			Per Cent	
	Number	Approximate		Number	Approximate
<i>Ages, in years</i>			<i>Occupation</i>		
Birth to 1	0	0	Chauffeur	2	3.2
2 to 9	1	1.6	Clerk	3	4.6
10 to 14	2	3.2	Farmer	11	17.1
15 to 19	7	10.9	Farmer-Housewife	4	6.2
20 to 29	12	18.7	Fireman	2	3.2
30 to 39	15	23.4	Housewife, rural and urban	14	21.8
40 to 49	8	12.5	Laboratory worker	1	1.6
50 to 59	5	7.8	Laborer	4	6.2
60 to 69	5	7.8	Manufacturer, merchant,		
Not reported	9	14.1	metal-worker, salesman,		
			storekeeper, teacher,		
Total	64	100.0	wood-worker (one each)	7	10.9
<i>Sex</i>			Veterinarian	1	1.6
Male	42	65.6	School children	5	8.0
Female	21	32.8	Not stated	10	15.6
Not reported	1	1.6			
			Total	64	100.0
Total	64	100.0			

In a few of the cases, an investigation was made of the milk supply of the patients giving positive agglutination reactions. Since this was not done in all cases, it is impossible to make a definite statement on the relationship of the use of raw or pasteurized milk, and the handling of cows to the incidence of undulant fever among the 64 cases listed in this series. The drinking of raw milk, the use of raw milk from cows in herds in which infectious abortion occurred, the milking of cows, and assistance in the delivery of calves, were frequently noted in reports on patients whose milk supply and habits were investigated. In a few cases, no evidence of the use of raw milk or contact with cattle could be obtained. Contact with swine was infrequent. Blood cultures were made in only 9 of the 64 cases. From 2 of these, organisms of the *abortus-melitensis* group were isolated. Whether these organisms are of the caprine, bovine or porcine type has not yet been determined.

Since the conclusion of this investigation, the question has arisen as to what may be expected from routine agglutination tests for undulant fever with all specimens of serum received at a laboratory. It is difficult to determine from examination of the records exactly how many positive reactions were obtained with specimens from patients whose illnesses did not arouse some suspicion that they might be due to the bacterium of undulant fever. Certainly, such cases were in one sense very few, and will undoubtedly become fewer now that attention is increasingly directed to the possibility that prolonged, irregular fevers,

arthritis, debilitated states, and intestinal and abdominal disorders may be manifestations of undulant fever. In such cases, it should become a routine procedure to examine the serum for agglutinins for organisms of the *Brucella* group. A few positive reactions will be obtained with serums in the general run of specimens submitted for serological tests for the diagnosis of syphilis. But the results of this investigation indicate that the physician and the laboratory can obtain information of the greatest value by having agglutination tests done in all cases of obscure fevers, and also in many periodically febrile cases in which the clinical diagnosis was that of probable tuberculosis, probable typhoid fever, probable "rheumatism" and probable malaria.

#### SUMMARY AND CONCLUSIONS

During the year 1929, 17 laboratories in the New York State Association of Public Health Laboratories undertook a coöperative investigation of undulant fever. The work was limited to the performance of the agglutination test with serums submitted to the laboratories for any purpose. An antigen composed of a suspension of killed *Brucella abortus* was used and a standard procedure was followed by all of the laboratories engaged in this work. Supplies were sent out from and reports were returned to a central laboratory. The investigation proceeded according to plan without difficulty, demonstrating that laboratories of this type, under directors appreciative of the value of investigation, could coöperate in a joint enterprise and obtain from the work information of both local and general value. While not an epidemiological study of undulant fever, this investigation furnishes some additional and confirmatory information on the incidence and distribution of the disease in New York State.

Reports were made on agglutination tests with serums from 3,716 patients. Of these, 64, or 1.72 per cent, gave positive agglutination reactions with the *Brucella abortus* antigen. All except one patient lived in New York State. While the final diagnosis in some cases had not been made, this investigation seemed to indicate that all of these were cases of undulant fever.

Agglutination reactions with dilutions less than 1-100 were obtained with 93 specimens of serum. With the possible exception of 2 old recovered cases of undulant fever, the diagnosis of undulant fever was not made in these cases.

Some degree of agglutination with the abortus antigen or melitensis antigen was obtained with 165 serums (4.44 per cent).

False positive reactions were given with serums containing hemo-

globin. No other known false positives occurred among many specimens from patients suffering from a great variety of diseases.

Among the patients whose serums gave positive reactions, those between the ages of 15 and 39 were most numerous (53 per cent). Males occurred in the series twice as often as females. Farming and occupations associated with farming and cattle raising were the occupations most frequently associated with positive agglutination reactions for undulant fever in this series. While the drinking of raw milk and contact with cows in herds having infectious abortion could be established in nearly every case in which a positive agglutination reaction was found, there were some instances in which these factors could not be shown to exist. The reports do not furnish information on the milk drinking habits and association with cattle of the 3,547 patients whose serums gave no agglutination with the abortus antigen. Contact with swine was infrequent and unimportant according to the reports on the cases in this series.

The discovery of cases of undulant fever was made through the use of the agglutination test. The experience of this investigation, however, indicates that very few positive reactions will be found from tests with the serums submitted for serological tests for syphilis in the ordinary course of medical practice. On the other hand, valuable and often decisive information will be obtained from routine agglutination tests with serums from patients suffering from obscure and periodical fevers, arthritis, intestinal and abdominal disorders, and with suspected tuberculosis and typhoid fever. It seems advisable to have this test performed as a routine procedure in many of these febrile conditions even when the clinical diagnosis has an aspect of assurance.

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## The Ganges and Public Health

THE year 1930 was marked by one of the largest religious festivals in India, which is held every 12 years, and which brought to Allahabad three and one-half million pilgrims, two and one-half million of whom bathed on the same day, January 29, in the Ganges. Great preparations had been made to assure the distribution of pure water, to ferret out the sick and place them in hospitals, and to increase the vaccinations. Only 168 cases of cholera were treated, and cholera was less frequent in India during the following two months than during the corresponding period of the preceding years.—*Pub. Health Rep.*, Nov. 7, 1930.



# The Industrial Nurse in Gear with the Machinery for Human Adjustment\*

VIOLET H. HODGSON, R. N.

*Assistant Director, National Organization for Public Health Nursing,  
New York, N. Y.*

THE basic objective of all public health nursing is the satisfactory adaptation of the individual to an environment that makes health possible. The adaptation may be physical, mental, spiritual, social or economic. Whichever it may be, each must be considered in relation to all the others if we wish to obtain an harmonious adjustment of the integral parts of the human machine. The environment may be the home, the school, or the plant. Each offers peculiar situations to which the human machine must be adjusted if production of all things necessary to health and happiness is to reach its maximum.

If industrial nursing shares this basic objective with other activities in the field of human adjustment, it immediately becomes evident that the service is not that of a simple one-unit machine, but a part of that more complex mechanism designed to produce the most satisfactory adjustment of the individual to his environment, which is naught else but the attainment of individual maximum capacity for production in the plant, the home and the community. It simply means that the industrial nurse must be in gear with this machinery for human adjustment. Coördination and proper sequence of all the gears in the community health machinery are essential in order to attain the maximum speed in making productive human adjustments with a minimum of friction and lost effort. The industrial nurse has a very real contribution to make to this process within and without the plant, if she is "timed" to perform her part in "proper sequence" with all the other agencies.

## WITHIN THE PLANT

The intra-plant relationships are admirably expressed by Bruere and Pugh in their definition of industrial relations: "The modern art of industrial relations is the act of courteous, coöperative accommodation of interests between employers and employees with a view to the successful operation of the business in which they are concerned."

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\* Read before the Virginia State Nurses Association, Virginia Beach, Va., May 23, 1930.

The health service of the nurse can be a real factor in increasing the effectiveness of such a program, if a coöperative relationship is maintained with the groups responsible for the administration of its various services.

The average worker is interested essentially in his earnings upon which he depends for the material things necessary for his health and comfort. About one-third of his time is spent in business. Modern management, although primarily interested in the quality and quantity of production of goods, has long since recognized that the healthy and happy worker is the greatest asset in attaining these objectives. The nurse in industry has the interests of both groups in mind and consequently makes her greatest contribution through the integration of her services toward the ultimate goal of satisfactory human relations within the plant.

*The Physician*—Through the practice of her nursing skills in the care of the sick and injured, under the direction of a physician, she helps the worker in reducing time that might otherwise be lost from minor accidents and injuries. This is a service of interest to employer and employee. Of more importance, though less accurately measurable, is her opportunity for prevention of incapacitating physical conditions, through education of workers in matters pertaining to health, and guidance in securing necessary medical service, both diagnostic and remedial.

*The Safety Engineer*—If the nurse is acquainted with, and interested in, the objectives of the safety engineer, she can assist him in interpreting his program of accident prevention to the worker and secure to the latter the means whereby he can coöperate most effectively in developing and promoting safety measures. No better opportunity is provided for doing concrete teaching than at the time when the employee is suffering from an infraction of the safety rules. Wise instruction at this time will enlist the active interest of the worker as a disciple of the gospel of prevention which he can share with his fellow workers. In like manner, keen observation and analysis of conditions which come to her attention in the first aid room will disclose many situations which should be called to the attention of the safety engineer for correction.

*The Personnel Manager*—The personnel manager recognizes the importance of mental health as well as physical in the satisfactory adjustment of the worker to his job. Production depends on adjustment to the work, fellow workers, and the foreman. Lack of understanding will result in excessive friction in the human machine with its concomitant loss of energy and, in extreme cases, in the eventual

breakdown of the machine itself. Recent studies in industrial fatigue have revealed the amazing influence of psychological factors in fatigue and variations in production. Rest periods have been found to relieve the monotony of repetitive processes, but release from disturbing mental factors has transcended the effects of physical rest. The opportunity to talk about anything that is troubling him has been, in many cases, all that was necessary to restore the worker to his original capacity for production. In the study, carefully selected individuals were chosen to provide this service to the employees. Although, at the present stage of the experiment, this would seem to be the ultimate function of the foreman, the part which the nurse can play in such a program has not been lost sight of. Through a sincere interest in the employee she should be able to gain his confidence so that he will seek her counsel in matters of mental and social as well as physical adjustment.

Public health nursing in industry is indeed but one of the many gears in the plant machinery for adjusting the employee satisfactorily to his environment.

#### IN GEAR OUTSIDE THE PLANT

Thus far it would seem as though our conception of the health needs of the employee depended entirely on the plant environment and his relation to it. Such is far from being the case. As a social being, the job is but the means whereby he can develop those instinctive social relationships upon which the whole structure of society depends. Participation in family and community life is essential in the well balanced life of the worker. Maladjustments of the parts of this machinery are reflected in the "loss of power of the driving wheels" in the plant.

Illness in the home may result in physical and emotional fatigue which inhibits the employee's output in the plant. In order to serve the interests of employer and employee most effectively, it becomes the responsibility of the nurse to take into consideration the needs of the employee in the home in so far as their influence affects his welfare in the plant. To do this requires a knowledge of the facilities available in the community for hospitalization, care of the sick in the home, and supervision of the health needs of each age group.

Furthermore, so closely can her teaching in the fundamental principles of personal and plant hygiene coincide with those of the visiting nurse and school nurse that we can truly speak of the joint efforts of all public health nurses in terms of a family and community health program. This objective can only be attained through close relation and adjustment of the parts in the community health machinery.

Personality difficulties are not confined to contacts outside the home. Management is aware of the unproductive friction caused by maladjustment of the employee to his fellow workers and to the foreman. Similar, and perhaps more devastating, waste results from social maladjustments outside the plant. Accidents are not always the result of ignorance and deliberate breaking of the safety rules. Mental preoccupation with an unhappy marital relationship may divert the mind of the employee just long enough to cause him to forget to replace the guard on the machine which later produces the injury. It is the wise nurse, with sound judgment and a real human interest, who will be able to sense situations which contribute to the problems of accident and illness observed in the plant, and who can act as a counselor without arousing the antagonism of the worker.

Modern management is averse to interference in the affairs of the worker outside the plant—and rightly so. On the other hand, helping the worker to help himself is but a fundamental principle upon which constructive health and social work is based, and in no wise partakes of the nature of paternalism. It is here that the art of human relations must be exercised with the greatest skill, if the nurse wishes to be of greatest service. Wise guidance to the community facilities available for administration of the service most needed at the time is all that devolves upon the nurse. Knowledge of and coöperation with the community machinery are prerequisites for the proper relationship of the gears in the machinery for such human adjustment.

The employee who comes to the nurse with problems of delinquency, lack of parental control, need of hospitalization, and other situations in the home, should expect guidance which conforms with the best accepted practices within that community. The advice of the industrial nurse should not run counter to that of other health agencies but should reinforce in the mind of the worker the instruction which his family may have received from the administering agency. Not infrequently it becomes her privilege to "close the sale" of a family health program. The preventive program of the local health department may offer exceptional opportunities for the plant nurse to assist in the prevention and control of communicable diseases.

Even of greater importance do these relationships become when we realize that health service in industry is largely confined to plants with 250 or more employees on the pay roll, and that a vast field remains uncovered in the smaller establishments, whose combined employment is slightly less than 50 per cent of the total. Here would seem to be a splendid opportunity for the local public health nursing association to extend its health services to all the members of the family, and in so doing might appropriately consider the necessary adjustments of their

program and the other community health machinery to meet the needs of industry.

The nurse in industry is one of a large group of health workers who has especial opportunity to emphasize the preventive rather than the curative aspects of disease. If the nurse is to keep pace with the progress that is being made in public health nursing, and if she expects her industrial nursing program to meet the needs of modern preventive medicine, it is of the utmost importance that she not only belong to her state and national nursing organizations, but that she contribute to their programs and share her experiences with her coworkers.

The nurse in industry profits by the stimulation that comes from discussing her problems with other workers in the public health field. The viewpoint of others is invaluable in broadening her own, and the entire group needs her contribution in developing and improving standards in the public health field.

#### CONCLUSION

Thus far our topic has been treated from the positive point of view, assuming the industrial nurse was in gear with the machinery for human adjustment in the plant and in the community. Unfortunately, there is a negative aspect, analogous to the situations found in maladjustment of the gears in a machine. "Too much play between the teeth of the meshing gears," "stripping of the gears," "lack of care in operation," and "unrelated gears," each, in turn, produces a condition in which "coördination and proper sequence" are interfered with, resulting in lost energy and interruption of power transmission from the motor to the drive wheels. Loss of time in reporting problems to other agencies, unwillingness to coöperate, resulting in a clashing of interests, neglect of the routine procedures of reporting, which are the mechanics of coöperation, and uncoördinated objectives are the counterpart situations in the machinery for human adjustment which result in a lessening of production and efficiency in helping the individual make a satisfactory adaptation to his environment.

As the efficiency of the plant machinery depends upon the skillful supervision of the mechanic, so, too, does the effectiveness of our social machinery depend upon the art of administering to the needs of the human machine. To the nurse in industry is afforded unequalled opportunities for the development of this service, not alone through her professional ministrations, but likewise in the practice of that more fundamental service, the art of human relations.

## EDITORIAL SECTION

*Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.*

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## THE FORT WORTH MEETING

FOR its fifty-ninth Annual Meeting, our Association chose the great Southwest, selecting the thriving city of Fort Worth, the site of an old fort.

All the forebodings that the distance from the North and East would have an injurious effect on the attendance were shown to be unfounded. The registration was 1,139, which compares favorably with other meetings, except those in one or two of the large eastern cities.

Particular interest attached to this meeting on account of the fact that it was the first held since our reorganization in 1929, and the first for which the newly created Committee on Meetings and Publications had arranged. All of the different sections had excellent programs, many in the form of symposiums, some of which were unusually notable and of extreme value to public health workers.

The meeting was especially important, as it marked what might be called the re-entrance of our sister Republics to the south into our deliberations. As Dr. Silva, Chief of the Department of Public Health of Mexico, pointed out in his address, our country has gone through the greatest of world wars, and his country has gone through much suffering during recent years. It was altogether an auspicious occasion, and we may well rejoice at once again taking up the lines which are of necessity of common interest to us, and reviving the delightful friendships which did so much to make our Association truly international in character in the past.

For the first time in the history of the Association, important representatives of the Health Services of all of our constituent members, Canada, the United States, Mexico, and Cuba, were present. Mexico was represented by 23 delegates, headed by the Chief of the Department of Public Health and a number of his staff.

Canada had 18 delegates, with Dr. Amyot, Deputy Commissioner of Health of the Dominion at its head.

Cuba was represented by Dr. Aristides Agramonte, who was elected to Honorary Fellowship in the Association on account of his notable career, and who gave an excellent address at the final banquet.

The State of Texas and the City of Fort Worth excelled themselves in hospitality. Their greeting was most warm, and continued throughout the stay of the delegates. Certainly the far-famed hospitality of the South was exhibited at its best.

Over 200 went on the post-convention tour to the City of Mexico, and there was universal regret among the delegates that all of them could not take part in this, which will doubtless further cement the bonds of friendship.

## AIR CONDITIONING FOR PREMATURE INFANTS

IT has long been recognized that one of the first prerequisites to start the premature infant on his way to independent existence is the conservation of body heat and energy. The necessity for maintaining a constant temperature accounts for the popularity of the small incubator, but very recent studies by Blackfan and Yaglou\* show that moisture and an ample supply of pure air are equally important, and that they are more readily and adequately controlled in a room by means of general air conditioning than in a small incubator.

After a 4-year study of the influence of air conditions on the growth and development of premature and other delicate infants, these workers arrived at certain requirements from a consideration of 4 valid criterions: stability in body temperature, gain in weight, incidence of diarrhea and of mortality, and general behavior of the infants under various air conditions. The air conditions were obtained by means of a modern conditioning system capable of warming and humidifying the air in winter and cooling and dehumidifying it in summer to any desired degree, regardless of outdoor weather.

The application of such a system to the premature nurseries of the Infant's Hospital in Boston resulted in marked improvements in the care of these infants. Stabilization in body temperature was associ-

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\* The engineering aspects of this work have already been published in the *Heating, Piping, and Air Conditioning Journal* for 1930.

ated with reduction in the incidence of diarrhea and in the general mortality. Infections were reduced to a minimum and gains in body weight increased.

In order to keep the atmosphere free from odors and maintain the desired temperature and humidity, a ventilation rate of 25 air changes per hour was required, and this had to be effected with an air movement not exceeding 15 feet a minute in order to avoid drafts.

Although we do not know the physiologic significance of the relation of odors of human origin to general ventilation work, evidence seems to warrant the conclusion that there are substances in the air of unventilated occupied spaces—even when the temperature and humidity are controlled—which in some way are capable of producing headache, nausea, loss of appetite and a disinclination for physical activity. These are sufficient to warrant adequate ventilation, particularly in the case of premature infants who are much more susceptible to infection than adults.

In addition to the physical heat loss, the moisture content of the air was found to exert a profound physiologic effect upon these infants. When a relative humidity of 30 per cent—a considerably higher value than that prevailing in unconditioned nurseries during cold weather—was maintained for 2 weeks or longer, the body temperature became unstable, gains in weight diminished, the incidence of diarrhea increased and the mortality rose. On the other hand, continuous exposure to air conditions with 55 to 65 per cent relative humidity gave very satisfactory results over a 2-year period. The best relative humidity was found to be 65 per cent.

The requirements for temperature depended to a considerable extent upon humidity. When the humidity was fixed, the temperature varied according to the general constitution of the infants and their body weight. For normal prematures the variation was from a minimum of 75° F. for infants weighing 4½ to 5 pounds to a maximum of 88° F. for infants weighing between 1½ and 2 pounds. For congenitally diseased infants, the variation was from 76° F. to 100° F. This latter group was cared for in individual electric incubators placed inside the conditioned nurseries, and the heat adjusted according to requirements. In this way, the infants benefited from breathing the comparatively cool room air at about 65 per cent relative humidity.

The striking benefits are attributed not only to improved air conditions but also to advances in medical treatment and to improvements in nursing and general care. It is fair to conclude, however, that the introduction of mechanical air conditioning has proved a distinct advance in the care and treatment of premature infants.



## THE TEETH AND DIET

IT is hard to escape the conclusion that oral hygiene is one of the neglected fields of preventive medicine. It is true that we have had toothbrush drills for some years and here and there an outstanding dental surgeon has raised his voice like "one crying in the wilderness." While the general facts as far as known have been more or less widely accepted, progress has been slow.

Miller, an American who did most of his work in Berlin, was one of the first to teach dental hygiene on what he considered a scientific basis. Following his views it has been generally held that caries depends upon conditions external to the teeth and it is hardly too much to say that even now the most prevalent idea is that carbohydrate stagnation is the chief cause of decay in teeth. The prevention of apical abscesses has not been successful while doctors and dentists, alike, have gone through an orgy of tooth pulling for the cure of practically all ailments for which some other definite cause could not be determined. Many types of toothbrushes and dentifrices fill our drug stores and advertisements pack the pages of current literature; yet it seems probable that conditions have not grown much, if any, better, unless the advice so widely given, to consult a dentist at least annually, has brought them about.

In England, where the dental conditions of children seem to be less favorable than in this country, the matter has engaged the attention of the Medical Research Council, largely on account of observations made by E. Mellanby in his epochal studies of rickets, during which he proved the power of the antirachitic vitamin, now known as D, and showed its controlling influence over calcification. Along with this he showed the injurious effect on calcification of certain cereals, especially oatmeal.

The extensive work of May Mellanby<sup>1</sup> has confirmed his findings and greatly advanced our knowledge along these lines. The proof has been given largely by experiments on dogs, but human studies are in progress, which so far have strengthened the conclusions drawn from animal work.

The teeth are a good index of calcification at varying periods during development, and not only their general development but their microscopic structure can be influenced and even determined by diet. Generally, foods containing a large amount of vitamin A are necessary; but D, which has now been shown to be a separate entity, is the determining factor and is found in varying amounts in foods contain-

as egg yolk, milk, and cod liver oil, or by irradiation of foods in which the ergosterol content is changed.

The production of perfect teeth also depends upon the presence of calcium and phosphorus in the diet. If the diet contains an abundance of vitamin D the required amount of these salts may be very small, but if the vitamin D intake is low extra calcium improves the teeth. In the absence of vitamin D perfect calcification does not take place no matter how much calcium and phosphorus is contained in the diet.

Sunlight may bring about the formation of good teeth even on diets which are defective, and irradiation has a similar effect, though improvement is not nearly so great as that produced by an abundant supply of vitamin D.

Certain cereals, especially oatmeal, seem to contain a material called by E. Mellanby "toxamin," which interferes actively with the normal development of teeth, but its evil effect is manifest only when there is an insufficiency of vitamin D, and is counteracted by an abundance of this substance. Exposure to sunlight, the good effect of which is recognized, has in some cases been ineffective when the diet contained a large amount of anti-calcifying substance. The amounts of calcium and phosphorus necessary for perfect calcification vary with the vitamin D content on the one hand and the toxamin content on the other. No explanation of this fact has yet been brought forward.

There are two practical applications of the facts brought out by this research. First, in point of time, is a proper diet for the mother during pregnancy and lactation, though it has also been shown that stored vitamins either in the mother or in the offspring may be utilized during a period of deficiency. The food which the mother receives affects not only the temporary but also the permanent teeth. The feeding of the offspring with an abundance of vitamin D is especially important for the permanent teeth, as the deciduous teeth seem to benefit by the vitamin stored in the mother's tissues before and during pregnancy and lactation.

It seems clear that by proper feeding of parents and young children defects in the structure of the teeth which are largely responsible for caries and other dental diseases may be avoided. The vast amount of dental disease which, in the aggregate, is one of the greatest sources of ill health can be appreciably prevented.

#### REFERENCE

1. Medical Research Council—*Special Report Series, No. 140.*

# ASSOCIATION NEWS

## SIXTIETH ANNUAL MEETING

MONTREAL, CANADA

SEPTEMBER 14-17, 1931

### DR. AGRAMONTE AN HONORARY FELLOW



ARISTIDES AGRAMONTE, M.D.

**A**RISTIDES Agramonte, M.D., was made an Honorary Fellow by the Governing Council at its meeting on October 28, in recognition of his inestimable services in the determination of the method of the transmission of yellow fever and its control.

Aristides Agramonte was born on the field of battle at Camagüey, Cuba, June 3, 1869, his father being one of those patriots who lost their lives in Cuba's attempt to gain independence.

His early life was spent largely in New York. He received his Bachelor of Arts degree at New York University in 1886, and was graduated in Medicine from the College of Physicians and Surgeons in 1892. He served as Sanitary Inspector and Assistant Bacteriologist to the New York City Department of Health, and was appointed Acting Assistant Surgeon of the U. S. Army in 1898, being a member of the famous Board headed by Walter Reed which gave the final proofs of the relation of the mosquito to the transmission of yellow fever. Since 1900 he has been Professor of Bacteriology and Experimental Pathology at the University of Havana, besides holding many other positions, such as Secretary and Chairman of the Board of Infectious Diseases, member of the National Board of Health, Public Health and Charities, etc. In 1919, he was given the Breant Prize by the Paris Academy. He has served as delegate to many congresses in this and other countries.

While he is best known for his work in yellow fever, he has written also on plague, dengue, trachoma, malaria, tuberculosis, typhoid fever, the intermarriage of lepers, and other subjects.

In making him an Honorary Fellow, the Association has honored itself as well.

POST-CONVENTION TOUR OF THE A. P. H. A. TO MEXICO CITY,  
OCTOBER 30-NOVEMBER 8, 1930

EMERY R. HAYHURST, M. D., PH. D., F. A. P. H. A., AND WILLIMINA M. RAYNE

*Ohio State University, Columbus, O.; and American Public Health Association,  
New York, N. Y.*

THE American Public Health Association's Special of 14 cars, bearing 204 members including their families, left Fort Worth at midnight, Thursday, October 30, at the close of the Fifty-ninth Annual Meeting, for a 9-day, all-expense tour to Mexico City. This was on the invitation of Dr. Rafael Silva, Chief, Departamento de Salubridad Publica, and of President Rubio of the Mexican Republic.

At 9 A.M., Friday, October 31, the group arrived at San Antonio, Tex. A reception committee of San Antonio citizens was present with a large number of automobiles for a sight-seeing tour on the invitation of Dr. W. F. King, Health Officer. The automobiles for the trip were provided by the Bexar County Medical Auxiliary and the 3-hour itinerary included the ancient Spanish Palace, San Fernando Cathedral, the Alamo and its Court, once the "massacre fort," the famous Missions of the Conception and San José, the business center of the city with its modern skyscrapers, the famous Sunken Gardens and Japanese Tea Garden in Brackenridge Park, and a whirl through the residential and market sections.

An excellent luncheon was served in the patio of the old Hotel Menger through the courtesy of the Chamber of Commerce and the County Medical Society. The party was entertained with an orchestra and cowboy songs. Dr. W. F. King presided. The speakers were Mrs. J. E. King, President of the Bexar County Public Health Association, Walter Walthall, President of the Chamber of Commerce, Mrs. Alex

Adams, Major Mickie of the U. S. Army, William McIntosh, Editor of *The Light*, and Señor Enrique Sante-banez, the Mexican Consul. On behalf of the delegation, Surgeon General Hugh S. Cumming, Dr. C. C. Young, Dr. A. H. Flickwir, and Dr. J. C. Anderson responded to the addresses of welcome. The Executive Secretary of the Association, who had accompanied the group thus far, left it to return to Fort Worth.

In the afternoon, a number of the members of the delegation accepted invitations to speak in the public schools in San Antonio, while trips were arranged to the sewage works, the water works, and other points of interest as befitted the desires of different groups.

At 4 P.M. the Special left San Antonio with a staff of 36 Mexican porters, waiters, cooks, bath-car attendants, a maid, etc. The bridge at Eagle Pass was negotiated at 9 P.M. with a welcome and no interference by the customs officials at Piedras Negras.

The delegation arrived in Monterrey next day at 12:30 P.M., and was met at the station by a military band. Dr. Silva, Dr. Miranda, Dr. Baez and other representatives of Mexico who had attended the Fort Worth sessions joined the party here, where Dr. Silva's special car was attached to the A. P. H. A. Special. The weather was murky in Monterrey and the delegates were thankful for the automobiles, driven by Mexicans and native Indians, and provided by the Medical Association of Mexico, from the depot to the Brewery Cuauhtemoc, where luncheon was provided. A city

orchestra and later a large military band filled the hall with resounding Mexican music. Dr. Guajardo welcomed the group, and Dr. B. J. Lloyd responded. From the luncheon building the delegation was taken to the beautiful new, white marble Federal Building, in which the offices and laboratories of the Health Department are located. Thence a trip was made to the hill site of Obispado or the Bishop's Palace from which a fine view of Monterrey is obtained with its circle of towering mountains. The itinerary was next through the residence section with its barred windows and doors and flat or mansard roofs, the American section, and back to the station whence the long train headed west to Saltillo, reached about 6 P.M. After a stop of 30 minutes, the train turned south with more mountain climbing through rugged areas of cactus, Joshua trees, etc., to the plateau of central Mexico. All night it seemed to be up and up.

All day Sunday, November 2, the train wound around mountain slopes, through defiles and over deep gullies, most of the time with two locomotives and with a most weird scenery of all varieties and sizes of cactus and "sticker" trees or mesquites, also sage and greasewood, but with never a pine or elm or other apparently deciduous plant in sight. What looked like apple trees were thorny huizaches. The great maguey cactus yields "pulque" and "tehuila," two native drinks of great renown. Occasional stops were made at interesting little adobe hamlets and villages with sometimes medieval haciendas and tiny chapels where the passengers intermingled with natives, most of whom had delicacies, cigarettes, chili or native wares to sell, and who posed their donkeys for photographs, although photographing certain domestic scenes was "taboo." Close inspection showed that what looked like willows were pepper trees or something else, and everything

that grew seemed possessed of stickers. Gorgeous cosmos, daisies, morning glories and flowering bushes, trees and cactuses were on every side. Occasionally butterflies swarmed, but bird life seemed scarce. The train passed areas of desert land, lava deposits, and mazes of arroyos, always flanked with mountains on either side until near Mexico City where the plateau broadened out, lakes and streams appeared and great corn, wheat and alfalfa fields, sometimes irrigated, extended to the distant mountains with herds of horses, cattle, sheep, and goats.

The famous city of Queretaro with its ancient viaduct was reached about 2 P.M., Sunday, and Mexico City itself at 9:30. The original plan called for arrival at 1:30 P.M., and a folklore pageant "Hamarandecua" had been arranged for 4 P.M. at the outdoor theatre Centro Venustiano Carranza, under the auspices of the Federal District, but it seemed that the special train was too long for speed and the stations too short for its length, features which, coupled with the sudden illness of one of the members of the party, necessitated several stops, so that the pageant was missed—greatly to the disappointment of the delegation and we feel, also, of our Mexican hosts who had gone to special effort to arrange it for us. Speaking of sickness, however, the crowd was fortunate indeed as only 2 or 3 cases came to notice throughout the 9-day period and these were not directly associated with the trip, which speaks well for the culinary service and care provided on the train and at the various luncheons and festivities. The Pullman cars were occupied as living quarters by all except a few who went chiefly to the Hotel Regis on the Alameda. In fact, not a few occupied the same train berths for 10 to 11 days, i.e., back to St. Louis and New York City.

In order to have a quiet sleeping place in Mexico City the A. P. H. A. Special

was side-tracked into Buena Vista Station and the site proved most satisfactory. Taxies could be obtained for one peso (48 cents, American money) to practically any point in the city, but for all regular meetings and trips some 15 auto-buses were provided each accommodating about 20 persons.

On Monday, November 3, the delegation was taken on a tour of the elaborate new Federal Health Buildings, which are arranged in a horseshoe shape with a central garden, fountain, and pond, and flanked in the rear with a large laboratory building. After the group had been photographed, it repaired to the library where the following program was given:

Address of Welcome. RAFAEL SILVA, M.D., Chief of the Departamento de Salubridad Publica (interpreted by Dr. Miranda).

Reply to Address of Welcome. HUGH S. CUMMING, M.D., Surgeon-General, U. S. Public Health Service, Washington, D. C.

History of Health in Mexico. ULISES VALDEZ, M.D., Secretary General, Departamento de Salubridad Publica (in Spanish).

Local Public Health Work. MIGUEL E. BUSTAMANTE, M.D., Director Public Health Unit, Veracruz, Ver. (in English).

After the addresses of welcome, the ladies of the party, who numbered nearly 100, at Madame Silva's invitation, left in motor cars for a sight-seeing tour of the city. This meant some event too, since Mexico City includes in its official bounds its suburbs, with a total population of about one million souls. About noon the groups met again at the Public Health Buildings and were conveyed in the auto-buses with the escort of the famous motorcycle squad of Mexico City which recently toured the States and also appeared in Hollywood motion pictures. In fact, members of the squad accompanied us on all of our trips, some of which were as much as 45 km. from the city, and we were constantly impressed with the expedition with which things moved. Contrary to the ex-

pectation of some of us, only a few soldiers were seen here and there while taxies of well-known American makes were really safer than in American cities. No traffic lights are seen in Mexico City, but the police stand on small boxes and direct traffic. Talk about being modern—nothing but motor vehicles (outside of bicycles, which are not numerous) are permitted on Mexico streets! Buses, street cars, automobiles and pedestrians keep up a continually changing scene everywhere, the main streets being broad and sunny. We had fine weather for all of our days in the city, which is at an altitude of 2,290 m. (7,444 ft.).

Our first sight-seeing trip was to Xochimilco. On the way out we stopped at the statue of Eduardo Liceaga on which a wreath was placed in his honor by Surgeon-General Cumming in behalf of the delegation, and the ever-present photographers were busy as ever. In fact, Mexican photographers are the most adroit in the world. Almost before you knew it, and indeed before they were dry, mounted photographs were for sale of each and every event and from all positions of vantage.

At Xochimilco a fine luncheon was served under the auspices of the Department of Public Health at the restaurant Las Flores, accompanied by orchestral music and Mexican songs. Dr. Ulises Valdez welcomed the party in Spanish, while Dr. Miranda in a fine flowing voice and an excellent command of English, acted as interpreter. Dr. Cumming responded in English. The party was then taken in small groups on gondolas for a tour of the canals between the tropical "floating islands," peopled and cultivated by Indian natives. Opportunity was also given to inspect the native Indian village.

We were then brought back to attend the reception at Chapultepec Castle, located on a rocky, conical hill

in the city, which was once the palace of Cortez and, before him, of the ancient Aztec rulers. Here each was given an opportunity to shake hands with President and Madame Rubio, a *tout ensemble* picture was made in the esplanade of the Castle, and guides were provided for a tour of the great building with its settings, rich in Maximilian lore, and of times before him. Thereafter the evening was free, and many visited the Alameda and the market district.

On Tuesday morning, November 4, the buses met the party in front of the station for an inspection trip of the buildings of the Federal Department, including the Institute of Hygiene, an infant clinic and maternity institute, and a tuberculosis dispensary. At noon, we left for the "Desert of the Lions," about 30 km. distant and at a considerable elevation, where the ancient Carmelite Monastery, of enormous dimensions, abandoned nearly a century ago, stands concealed in the heavy pine forest in a mountain gorge with its walls, gardens, and subterranean passages still in a fair condition of repair. Luncheon was served here in the open air under the shelter of huge trees and the great garden wall. This was under the auspices of Secretary of Public Works Gral. Juan Andrew Almazan. Dr. Grucman gave the address of welcome which Dr. Miranda interpreted. A chorus of five native male voices and a solo were splendid events.

At 4 P.M. the party left for the return drive to Mexico City. At 8 that evening, the group was invited to attend a concert at the Theatre Hidalgo, given by the Women's Symphony Orchestra. Following this there was a dance at the invitation of the Cosmopolitan Club in Chapultepec Restaurant—a great round, glassed-in building—where caballeros tripped with beautiful señoritas till 1 A.M.

On Wednesday, November 5, at 9:30

A.M., the group again went to the Department of Public Health, where the following scientific papers were read:

Address—B. J. LLOYD, M.D., Pan-American Sanitary Bureau, Washington, D. C.  
Safeguarding a City Milk Supply. H. V. CARDONA, D.V.M., Supervisor of Milk Sanitation, Department of Public Health and Welfare, Fort Worth, Tex.

Because of Mrs. Silva's illness, her invitation to the ladies of the party to take a trip to Cuernavaca was cancelled, but independent tours were arranged by the Wells Fargo Company and in private conveyances. A goodly portion of the members made the trip of 75 km. over a splendid highway which soon reached elevations giving a splendid view of Mexico City and less distinctly of the great peaks, Popocatepetl and Iztacchihuatl. Finally the highway topped a mountain pass at 3,008 m. (9,850 ft.), to drop down into a fertile semi-tropical region on the west side of the mountains and into ancient Cuernavaca, where Cortez had his palace and gardens (now open to visitors) and where the summer home of Ex-Ambassador Morrow was visited. Some sought out the cathedral, others the narrow streets of the market and pottery venders; some enjoyed a native luncheon of tortillas stuffed with chicken and aguacates.

At 7 P.M. the doctors of the party were received by the doctors of the National Academy of Medicine, where Surgeon-General Cumming was decorated a Fellow of the National Academy. At 9 P.M. there was a concert of Mexican music and dancing at the Preparatory School given by the Department of the Federal District. Here one also had leisure to inspect the magnificent wood carvings and panels of the interior.

On Thursday morning, motor buses took the delegation to visit the clinic of the Department of Education, where nose, eye, ear, throat and skin diseases

are treated. Some rose early and visited the Cathedral—the largest in America—the National Museum with its great Aztec Calendar Stone and the San Carlos Art Gallery. Next, the party was conveyed to San Juan Teotihuacan, 45 km. distance, the place of the great Toltec Pyramids of the Sun and the Moon, and the lesser "Lights." After visiting the museum here, one walked the "Path of the Dead." Many ascended the Pyramid of the Sun. Some visited the Open-Air Theatre hedged about with tall organ cactuses. Some visited the excavated temple, Ciudadela, and saw the ornately carved Pyramid of Quetzalcouatl (the Feathered Serpent). Luncheon was served in the Grotto Restaurant, a great cavernous subterranean space well lighted by natural rocky apertures on one side. This luncheon was under the auspices of the Secretary of Public Education, whose representative greeted the party, and where Dr. Cumming replied on behalf of the delegation. Dr. Valdez spoke eloquently, and his speech was interpreted by Dr. Miranda. It was indeed a strange sight to see some 300 people seated at long tables in the Grotto with two Mexican orchestras occupying upper ledges, and the frequent explosions of the photographers' flash powders; nor will one soon forget the fine native songs of the entertainers.

On both the going and return trips to the Pyramids, the mists of Lake Tetzoco were seen, blending with the

distant sky. Stops were made at the Shrine of Guadalupe Hidalgo. On the outward trip some ascended the long stairway of the Convent Hill.

After dinner, served on the train—our meals were served in the two Pullman dining cars attached to the train—a Mexican band in grey uniforms filed through the station to the train platform while the delegation crowded the observation car and the various car entrances to hear "The Swallows," the Mexican farewell song, the strains of which accompanied our "Adios" to Mexico City as the train slowly pulled out into the darkness.

We were not long enroute before we discovered that Dr. Pruneda had delivered to the train innumerable gift packages, one for each member of the delegation, containing souvenirs of Mexican art. During the homeward trip an interested representative of the group in each car collected contributions for gifts for Dr. Silva and Dr. Miranda. The delegation also requested the Executive Board of the Association to draw up suitable resolutions expressing its appreciation of the hospitality of the Mexican officials, and their tireless efforts which had made the visit to Mexico City such an outstanding success.

At 5 P.M., on November 8, the special train reached Fort Worth, and members of the delegation went their separate ways, most of them carrying home a good tan from Mexican sunshine.



## NEW MEMBERS

*Health Officers Section*

T. A. Callahan, Bel Air, Md., Assistant Deputy Health Officer  
 D. St. C. Campbell, La Plata, Md., Deputy State Health Officer  
 Eugene O. Chimene, M.D., Austin, Tex., Assistant Health Officer  
 John W. Copeland, M.D., Auburn, N. Y., Health Officer  
 Mordy A. Elstein, M.D., Lovington, New Mex., County Health Officer  
 Alva C. Hamblin, M.D., Brooksville, Fla., District Medical Officer, State Board of Health  
 Harvey B. Henry, M.D., Luling, Tex., City Health Officer  
 J. A. Jackson, M.D., Vernon, Ala., County Health Officer  
 A. C. Jones, M.D., Kingsville, Tex., City and County Health Officer  
 Sidney L. Kuposky, Dorchester, Mass. (Assoc.)  
 James D. Lowry, M.D., Fort Dodge, Ia., Member, State Board of Health  
 William J. MacDonald, M.D., Wellsburg, W. Va., County Health Officer  
 Bradford Massey, M.D., Pocomoke City, Md., Deputy State Health Officer  
 Crispin B. Matha, Ann Arbor, Mich. (Assoc.)  
 Rollin E. May, M.D., Lexington, Ky., Director, Fayette County Health Dept.  
 Charles W. McDonald, DeFuniak Springs, Fla., District Medical Officer  
 A. M. Morris, Langhorne, Pa., Health Officer  
 O. C. Pierson, St. Paul, Minn., Director, Division of Administration, State Board of Health  
 Edward L. Russell, M.D., Santa Ana, Calif., Deputy Health Officer, Orange County Health Dept.  
 William J. Sandige, M.D., Shreveport, La., Director, Caddo Parish Health Unit  
 A. C. Shamblin, M.D., Cartersville, Ga., Commr. of Health, Bartow County  
 Hugh H. Shaw, M.D., Utica, N. Y., Health Officer  
 W. H. Sory, M.D., Jacksonville, Tex., City Health Officer  
 F. K. Soukup, M.D., Port-au-Prince, Haiti, Public Health Officer, National Public Health Service  
 I. C. Sumner, M.D., Chatom, Ala., County Health Officer  
 J. W. Wallace, M.D., Douglas, Ga., Health Commissioner  
 Edward M. Williams, M.D., Oskaloosa, Ia., Health Officer

*Vital Statistics Section*

Maria Doyle, Phoenix, Ariz., Vital Statistics Dept. Bookkeeper (Assoc.)  
 Paris R. Eastman, New York, N. Y., with Metropolitan Life Insurance Co.  
 Mrs. Anna Galbraith, Phoenix, Ariz., Statistician, State Board of Health  
 Mrs. Naomi P. Goodin, Jefferson City, Mo., Statistician, State Board of Health  
 Mrs. Marie B. Strassburger, Sacramento, Calif., Registrar of Vital Statistics

*Laboratory Section*

Harry E. Braun, M.D., Houston, Tex., Pathologist, Jefferson Davis Hospital  
 Cooper Brougher, Selma, Ala., Director, State Branch Laboratory  
 Elizabeth C. Brown, St. Louis, Mo., City Dept. of Health Laboratory  
 Eleanor Bullock, Albuquerque, N. Mex., Bacteriologist, State Public Health Laboratory  
 H. L. Burger, Lawrence, Kans., City Bacteriologist  
 Fred Cadham, M.D., Winnipeg, Man., Bacteriologist, Manitoba Medical College  
 Gertrude E. Connor, Lansing, Mich., Bacteriologist  
 Jane B. Currie, Tallahassee, Fla., Director, State Board of Health Laboratory  
 Margaret M. Diehm, Ph.D., Philadelphia, Pa., Instructor in Bacteriology  
 Martha O. Eckford, Sc.D., Columbus, Miss., Professor of Bacteriology and Hygiene, State College for Women  
 Wilson D. Elliott, Ottumwa, Ia., Milk Inspector, Bacteriologist for Water Works  
 Richard V. Goslau, Cedar Grove, N. J., Laboratory Technician, Dept. of Health  
 Walter T. Harrison, Washington, D. C., Surgeon, U. S. Public Health Service, National Institute of Health  
 D. E. Hasley, Detroit, Mich., Instructor  
 Harriet C. Hollon, Grand Rapids, Mich., Bacteriologist, Dept. of Health  
 Roberta Lovely, Montclair, N. J., Bacteriologist, Dept. of Health  
 Margaret MacLanahan, Butte, Mont. (Assoc.)  
 Ora M. Mills, Houghton, Mich., Assistant Director of Laboratories, State Dept. of Health  
 Mary P. Moffett, Elmhurst, Pa. (Assoc.)  
 William B. Sarles, Ames, Ia., Instructor in Dairy Bacteriology, Iowa State College  
 Morris F. Shaffer, Cambridge, Mass., Instructor, Massachusetts Institute of Technology  
 Pauline K. Smith, Ann Arbor, Mich. (Assoc.)

Beulah Teter, Monrovia, Calif., Bacteriologist,  
City Health Dept. Laboratories  
Alvina L. Todd, R.N., Paterson, N. J., Nurse,  
St. Joseph's Hospital  
Henry Welch, Ph.D., Hartford, Conn., Re-  
search Biologist, State Dept. of Health  
Hannah Wollack, Oklahoma City, Okla., State  
Bacteriologist  
Dr. Jose Zozaya, Glenolden, Pa., with Mul-  
ford Laboratories

#### *Industrial Hygiene Section*

Frederick W. Jackson, D.P.H., Winnipeg,  
Man., Deputy Minister of Health

#### *Public Health Engineering Section*

James D. Brew, Ph.D., Albany, N. Y., Milk  
Specialist, State Dept. of Health  
Marion L. Christ, Los Angeles, Calif., As-  
sociate Engineer  
H. J. Darcey, Oklahoma City, Okla., State  
Sanitary Engineer  
James D. Fowler, Dallas, Tex., Consulting  
Sanitary Engineer  
Edward Groeniger, Columbus, O., Consulting  
Sanitary Engineer  
Robert E. Hackley, Palo Alto, Calif., Civil  
Engineer  
Charles M. Harrison, Houston, Tex., Chief  
Sanitary Inspector, City Health Dept.  
James T. Holahan, Rochester, N. Y., Con-  
tractor, Sewers and Disposal Plants  
Thomas Holahan, Rochester, N. Y., Contrac-  
tor, Sewers and Disposal Plants  
Ralph E. Humphries, Pasadena, Calif., Act-  
ing Chief District Sanitary Inspector  
J. A. LePrince, Memphis, Tenn., Malaria  
Control Invest., U. S. Public Health Service  
George R. MacLeod, Montreal, Que., Assistant  
Chief Engineer  
Lester D. Matter, Chicago, Ill., Engineer, In-  
ternational Filter Co.  
John R. Menzies, Montreal, Que., District  
Engineer, Dept. of National Health  
James P. Miller, Houston, Tex., Sewage Dis-  
posal  
Malcolm Pirnie, New York, N. Y., Consult-  
ing Engineer  
Hood Pitts, Austin, Tex., Consulting Engineer,  
State Board of Control  
Charles L. Pool, Providence, R. I., Chief  
Engineer, State Public Health Comm.  
Phil O. Purdum, Amarillo, Tex., Manager,  
Steffen Ice & Ice Cream Co. (Assoc.)  
F. A. Schramm, Dallas, Tex., District San-  
itary Engineer, State Dept. of Health  
Francis J. Sette, Blacksburg, Va., Assoc. Pro-  
fessor of Sanitary Engr., Va. Polytechnic  
Inst.

Harry C. Sinks, Salem, Ore., County Sani-  
tary Officer  
Richard G. Thomas, San Antonio, Tex. (As-  
soc.)  
L. E. Winder, Nacogdoches, Tex., City Sani-  
tary Officer  
W. W. Young, New York, N. Y., Consulting  
Engineer

#### *Food, Drugs and Nutrition Section*

Samuel Abraham, New York, N. Y., Milk  
Inspector, City Health Dept.  
James J. Cooney, New York, N. Y., Inspec-  
tor of Foods, Dept. of Health  
William L. Dougherty, New York, N. Y., In-  
spector, Dept. of Health  
Harry H. Field, New York, N. Y. (Assoc.)  
N. S. Grubbs, Detroit, Mich. (Assoc.)  
W. P. B. Lockwood, Boston, Mass., Mgr. Di-  
rector, N.E. Dairy and Food Council  
Malcolm J. MacLeod, Brookline, Mass., Food  
and Drug Chemist  
John Pierson, Orlando, Fla., Health Inspector

#### *Child Hygiene Section*

Ruth C. Bartlett, Hartford, Conn., Supv. Child  
Health Work, Visiting Nurses Assn.  
Vera C. Caldwell, Phoenix, Ariz., Public  
School Nurse  
Mrs. J. M. Chase, San Antonio, Tex. (Assoc.)  
Mrs. S. P. Cunningham, San Antonio, Tex.  
(Assoc.)  
Ellen L. Lytle, Cambridge, Mass., Research  
Assistant, Massachusetts Institute of Tech-  
nology  
Joseph F. Paulonis, M.D., Brooklyn, N. Y.,  
Pediatrician, Bushwick Hospital  
Anne B. Price, New York, N. Y., School  
Health Bureau, Metropolitan Life Insur-  
ance Co.  
Albert B. Siewers, M.D., Syracuse, N. Y.,  
Psychiatrist, Preschool Dept. of Health

#### *Public Health Education Section*

Edwin Boonstra, D.D.S., Traverse City, Mich.,  
Public Health Dentist  
Fannie M. Brooks, Urbana, Ill., Asst. Prof.  
Home Economics, Univ. of Ill.  
P. H. Byrns, St. Louis, Mo., Exec. Secy., St.  
Louis Chapter, American Red Cross  
Curtis L. Cohee, Philadelphia, Pa., Exec.  
Secy., Phila. Inter State Dairy Council  
Hart M. Devenney, Montreal, Que., Direc-  
tor, Recreation and Phy. Ed., Southwestern  
Y. M. C. A.  
Matilda Dreifus, New York, N. Y., Head-  
worker, Federation Settlement  
Helen B. Fenton, Santa Rosa, New Mex.,  
County Public Health Nurse

Clyde D. Frost, M.D., Chicago, Ill., Associate for Medical Services, Julius Rosenwald Fund

Adrian G. Gould, M.D., Ithaca, N. Y., Asst. Prof. of Hygiene, Cornell Univ.

Gertrude Greul, Boston, Mass., Exec. Secy., Norfolk County Health Assn.

Gordon Hastings, M.D., Little Rock, Ark., Dir., Rural San., State Board of Health

Mildred C. Hecker, R.N., Altoona, Pa., Exec. Secy., Blair County Tuberculosis and Health Society

Burt B. Ide, D.D.S., Baltimore, Md., Dental Member, State Board of Health

Lewis S. Jordan, M.D., Granite Falls, Minn., Supt., Riverside San.

Sadie Jordan, Royal Oak, Mich., City Health Nurse

Lucy M. Kennedy, Augusta, Ga., Supv. of Mouth Hygiene, State Board of Health

Gertrude Lingham, Madison, Tenn., Instructor, Dept. of Nursing Education, George Peabody College for Teachers

William H. Luedde, M.D., St. Louis, Mo., Member, Advisory Comm., National Society for Prevention of Blindness

Rufus A. Lyman, M.D., Lincoln, Nebr., Dean, College of Pharmacy, Univ. of Nebraska

Violet B. Marshall, Berkeley, Calif., Dir., Dept. of Phy. Ed. for Women, Univ. of California

Elizabeth Merrill, Parkersburg, W. Va., Public Health Worker

May I. Millbrook, M.D., Urbana, Ill., Member of Staff, Univ. of Illinois

Winifred Moses, New York, N. Y., Exec. Secy., Health Program for Women's Ed. Org.

Pat I. Nixon, M.D., San Antonio, Tex., School Physician

Margaret B. Pierce, Bronxville, N. Y., Health Dir., Sarah Lawrence College

Frank X. Rathgeber, Brooklyn, N. Y., Charge, Country Milk Inspection

Ferdinand O. Reinhard, M.D., Baltimore, Md., Acting Dir., Bur. of Comm. Dis., City Health Dept.

Emmeline J. Renis, R.N., Houston, Tex., Exec. Secy., Houston Anti-Tuberculosis League

William H. Ross, M.D., Brentwood, L. I., Pres., Suffolk County Board of Health

Jules V. Roule, M.D., Augusta, Ga., Instructor, Dept. of Prev. Med., Univ. of Georgia

Dr. R. W. Rutherford, Wichita Falls, Tex., Dairy Inspector

Harry A. Salzman, M.D., Chicago, Ill., Dispensary Physician, Mun. Tuberculosis San.

Everett S. Sanderson, Ph.D., St. Louis, Mo., Asst. Prof. Bacteriology and Public Health, Wash. Univ. Med. School

Henry Schoeneck, Syracuse, N. Y., Professor of Obstetrics

Alfred Seale, Palo Alto, Calif., Chairman, Board of Public Safety

Mrs. Joe H. Smith, Lubbock, Tex., Supv. of Health Ed., Public Schools

George E. Snyder, Johnstown, Pa., Instructor, Univ. of Pittsburgh

Mrs. Ralph W. Taylor, Painesville, O., with Lake County Public Health League

Alfred P. Upshur, M.D., New York, N. Y., Assoc. Medical Dir., Life Extension Inst.

William F. Van Buskirk, Ann Arbor, Mich. (Assoc.)

Prof. Martin Vogel, Dresden, Germany, Educational Dir., German Hygiene Museum (Assoc.)

Pearl E. Wilson, Oklahoma City, Okla., Dir., Dental Health Education, State Dept. of Health

#### *Public Health Nursing Section*

Mary Andris, Portsmouth, O., County Health Nurse

Alice C. Baker, Pittsburg, Calif., Health Center Nurse

Louise C. Buhner, R.N., Dillon, Mont., Supt. of Barrett Hospital

Mary G. Close, R.N., Las Cruces, New Mex. (Assoc.)

Charlotte Eaton, Hartford, Conn., Educational Dir. of Hartford Visiting Nurse Assn.

Sarah G. Emery, Port Worth, Tex., School Nurse

Frances Gayle, San Antonio, Tex., Public Health Nurse

Charlotte M. Hanson, Rochester, Minn., School Nurse

Robina Kneebone, Richmond, Va., Prof. Public Health Nursing, College of William and Mary

Elizabeth E. Kuntze, Berkeley, Calif. (Assoc.)

Carrie E. Lewis, Cleveland, O., Asst. Dir. of Nurses, Dept. of Health

Anne Martin, Big Spring, Tex. (Assoc.)

Mary A. McGarry, R.N., Syracuse, N. Y., District State Supv. Nurse

Celia Moore, R.N., Austin, Tex., State Itinerant Nurse

Irene A. Nichter, Lancaster, N. Y., Public Health Nurse

Eileen Patenaude, R.N., Green Bay, Wis., City Nurse

Marguerite A. Reverdy, R.N., New Cumberland, W. Va., County Nurse

Dora Roberts, Big Spring, Tex. (Assoc.)

Catherine Sampson, Catonsville, Md., Visiting Nurse, Johns Hopkins Hospital

Mrs. M. R. Showalter, Big Spring, Tex., Public Health Nurse, Howard County

Katherine F. Small, Paso Robles, Calif., Public Health Nurse  
 E. Winnifrede Smith, Geneseo, N. Y., Public Health Nurse  
 Elizabeth F. Spearman, R.N., Asheville, N. C., Supervisor, Mission Hospital  
 Esther Spicer, Baltimore, Md., Director, Prenatal and Obstetrical Work, Johns Hopkins Hospital  
 Eleanor Stockton, San Francisco, Calif., Director, Bur. of Field Nursing, Dept. of Health  
 Lucile Stone, Uvalde, Tex. County Health Nurse  
 Mrs. Fox Stripling, Big Spring, Tex. (Assoc.)  
 Lona L. Trott, St. Louis, Mo., Asst. Director, Nursing Service, Midwestern Br. Amer. Red Cross  
 Helen O. Van Orden, Alameda, Calif., Nurse Inspector, High School  
 Sophia D. Weisbard, San Luis Obispo, Calif., School Nurse  
 Grace L. Wiley, R.N., Mayetta, Kans., Field Nurse, Indian Service  
 Sadie E. Wolf, Ann Arbor, Mich. (Assoc.)  
 Mary L. Wright, Detroit, Mich., Asst. Dir., Visiting Nurse Assn.

#### *Epidemiology Section*

Arnold S. Anderson, M.D., St. Paul, Minn., Exec. Secy., Tuberculosis Director, State Board of Control  
 Michael J. Bent, Nashville, Tenn., Dir., Dept. of Bacteriology, Meharry Medical College  
 Travis P. Burroughs, M.D., Olean, N. Y., Deputy County Commr. of Health

Walter Clarke, New York, N. Y., Director, Medical Measures, American Social Hygiene Assn.

Margaret C. Herrick, Augusta, Me., Asst. to Dir., Div. of Com. Dis., State Dept. of Health

Austin U. Simpson, M.D., Seattle, Wash., Epidemiologist, State Dept. of Health

Richard Slee, M.D., White Plains, N. Y., Deputy Commissioner, Dept. of Health

Vivian A. Van Volkenburgh, M.D., Baltimore, Md., Associate, Dept. of Epid., Johns Hopkins Univ.

#### *Unaffiliated*

J. L. Carpenter, Greenville, S. C., Member, Executive Committee, State Board of Health

Wyman C. C. Cole, M.D., Detroit, Mich. (Assoc.)

Charles R. Hoover, Middletown, Conn., Research in Trade Waste Disposal

Alvin E. Keller, M.D., Nashville, Tenn., Asst. Prof. of Preventive Medicine, Vanderbilt Medical College

Daniel M. Molloy, M.D., Guatemala, C. A., Member, Field Staff, International Health Division, Rockefeller Foundation

Mrs. Lewis S. Thompson, Red Bank, N. J. (Assoc.)

#### DECEASED MEMBERS

Dr. John A. Cecconi, Dorchester, Mass., Elected Member 1922, Fellow 1928

Elliot H. Gage, Chicago, Ill., Elected Member 1917, Fellow 1923

Abilio De Castro, M.D., Brazil, S. A., Elected Member 1926 (Assoc.)

# PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

## CONVALESCENT SERUM CLINIC

EDGAR E. MARTMER, M. D.

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THE Convalescent Serum Clinic of the Detroit Department of Health was opened January 17, 1928, at the Herman Kiefer Hospital. Its purpose is to provide convalescent serums for passive immunization and therapeutic treatment of the acute communicable diseases.

The immediate emergency which led to its establishment was the measles epidemic of 1927 and 1928. This epidemic was rather severe, and since the only reliable method of preventing or modifying the disease is the use of human serum from convalescents, it was decided to attempt to provide the physicians of Detroit with sufficient serum to passively immunize infants and children under 4 years of age who had not had a previous attack, and who had been in direct contact with a case of measles.

With the success of the work with measles serum, the activities of the clinic were extended to include convalescent serums for scarlet fever, mumps, chicken pox, whooping cough, and poliomyelitis. Small amounts of serum were also collected for experimental use in the treatment and prophylaxis of influenza, meningococcic meningitis and pneumonia.

With the announcement of the availability of these serums there has been an increase in the demand for them, which has resulted in a rapid growth of the clinic. During the first

year 327 donors were used. In 1929 the number rose to 458, while in the first half of 1930 there were 460 donors, which will make the total for the year over 900.

There has been a marked increase in the demand for convalescent scarlet fever serum, there having been produced in 1928, 8,212 c.c. of scarlet fever serum; in 1929, 29,925 c.c. At the present rate we will produce approximately 48,000 c.c. in 1930. Table I shows the amounts of serum we have produced and distributed up to July 1, 1930.

TABLE I

Disease	Total			
	No. of Donors	C.c. of Blood	C.c. of Serum	Doses
Scarlet Fever	566	121,400	59,137	10,887
Measles	162	73,920	40,129	4,912
Whooping Cough	72	16,265	7,987	624
Chicken-pox	74	15,885	8,855	564
Poliomyelitis	63	13,360	6,697	191
Normal	62	11,950	5,608	181
Mumps	39	6,305	3,490	391
Influenza	8	1,900	910	10
Meningococcic Carriers	8	1,735	825	
Meningococcic Meningitis	4	980	460	
Total	1246	271,865	133,198	17,760

It is not the purpose of this paper to show the value of convalescent blood serums in the prevention and treatment of the acute communicable diseases, but rather to show that it is possible to ob-

tain a large number of donors and a sufficiency to make the supply of convalescent serums available to all who require it.

The personnel of the clinic consists of 1 part-time physician, 2 full-time nurses, and 1 technician.

The first step in the operating and maintaining of a clinic depends upon having available the names and addresses of all cases of communicable disease, and this is made possible by the use of the files of the Communicable Disease Division of the Department of Health. As every case of communicable disease is released from quarantine, a slip is sent by the registrar to the Communicable Disease Division, notifying them of the release of the case. This information is in turn forwarded to the Serum Clinic. The names are filed and used as necessary. A letter is sent explaining the work of the Serum Clinic, and asking recovered cases, if they are physically fit, to write, telephone or make a personal call to discuss the question of giving serum. As a report is received, a definite appointment is made, and donors are requested not to take any food in any form for at least 3 hours preceding their visit to the clinic. They are assured at this time that sufficient blood will not be taken to inconvenience them in any way.

When they arrive at the clinic, history is taken, both personal and communicable disease. The personal history includes the name, address, telephone number, age, sex, weight, and color, also the date of recovery from the communicable disease for which they are donating blood, and the name of the physician who attended at the time of illness.

The blood is taken by introducing a 16 gauge sterile needle into the vein of the forearm, and from 100-400 c.c. of blood is drawn into sterile flasks. After the blood is taken, the donors

are paid \$10 in cash at once, and asked if they are willing to return. If they are willing, and the blood is satisfactory, a form letter is mailed to them in 2 weeks, and once a month thereafter for one year, making further appointments.

The blood which has been withdrawn is immediately placed in the icebox, and the following morning the flasks are centrifuged and the clear serum withdrawn. A sample of the serum is tested by the Kahn and Wassermann tests, and, if the reports are negative, this serum is then pooled with several other quantities of the same type of serum. Carbolic acid in a proportion of 0.4 per cent is added, and the serum is then tested for sterility.

A second sample is typed and the results recorded so that donors of serums for various communicable diseases are available according to type for transfusion purposes.

After being proved sterile, it is bottled in containers in quantities of 7.5 c.c. for prophylactic use, and 30 c.c. for therapeutic use, these amounts having been found to be the most satisfactory. The serum is then incubated for a week and again tested for sterility. If the packages are sterile, they are labeled and given a batch number, so that we are able to trace any given dose of serum. Samples are also kept for future study.

When a physician desires convalescent serum for either prophylactic or therapeutic use, he can obtain it at the Department of Health, the only requirement being that he furnish a report as to its value. The value of the serum has been reported by other members of this department, and further studies are under way.<sup>1,2</sup>

#### REFERENCES

1. Meader, F. M. Scarlet Fever Prophylaxis, *J. A. M. A.*, 94: 622-625 (Mar. 1), 1930.
2. Gordon, J. E., and Meader, F. M. The Period of Infectivity and Serum Prevention of Chickenpox, *J. A. M. A.*, 93: 2013-2015 (Dec. 28), 1929.

**Domestic Employees in Newark—**

In Newark an ordinance took effect September 1, 1930, requiring that all domestic servants should have a physical examination either at the hands of a licensed physician or, without charge, by the Department of Health. The Health Department issues a certificate which is good for a period of 6 months, indicating that the domestic has been found free from tuberculosis and any other contagious or communicable disease. The regulations of the department require that all restaurant and kitchen employees, where food is cooked or served, must come to the Health Department Clinic for examination. An exception is made for a few large department stores and insurance companies where complete clinic facilities are available. All other food handlers, including: grocers, milk dealers, confectioners, bakers, butchers, soda dispensers, etc., and domestic employees may be examined by private physicians or at the Health Department clinics. It is stated that 90 per cent of these examinations are made at the clinics. When made by a private physician, the examination must be reported on blanks provided by the Department of Health.

—C. V. Craster, Health Officer.

**Clinical Conferences on Communicable Diseases—**In the belief that ultimate progress in preventive medicine must depend on the degree of interest evidenced by the practicing physician, the Detroit Department of Health for the past 2 years has conducted its toxin-antitoxin campaign in direct collaboration with the private physician, rather than by means of public health clinics. The success of this project, in stimulating general interest in preventive medicine among the profession, was so gratifying that the idea has been further extended. Aside from accomplishing specific prophylaxis, the most important method by which the private physician

can aid in limiting communicable disease consists in early diagnosis of actual infections which arise in his practice. The number of contacts is thereby limited and early treatment favors a lower case fatality.

The contact of the Department of Health with the medical profession has largely been by means of lectures, literature and general educational measures. In an attempt to reach the physician more intimately, and to offer something of more direct relation to the practical problems of his profession, the Department of Health and the Public Health Committee of the Wayne County Medical Society last year inaugurated a series of clinical conferences on communicable diseases. Practical problems in early diagnosis and demonstration of preventive and therapeutic measures were presented by means of case histories and the demonstration of patients. These conferences were so successful, both from the standpoint of attendance and interest, that the committee arranged for a second series which started October 29, 1930. In response to numerous requests this activity has been extended to include all physicians in the southeastern part of the state and all others in Michigan who may find it possible to attend. Health officers are particularly invited to these clinics.—Detroit Department of Health.

**Epidemic Jaundice—**During the month of October, 1929, the attention of the Health Officer and School Physician was drawn to the appearance of jaundice among the school children. Eight cases were found during the month, and on October 24, 1929, two specimens of urine were taken to Dr. Flexner, at the Rockefeller Institute for Medical Research. On October 25, 1929, Dr. Flexner reported finding moving spirochetæ under the dark field microscope and that guinea pigs had been inoculated. On November 4,

1929, Dr. Flexner reported that the guinea pigs had died and showed the lesions and symptoms of infection with *Leptospira icthohemorrhagiae*, and that the carrier of the disease was the rat. Sporadic cases occurred during the winter months to the middle of April, 1930, amounting to 17 cases.

Clinically the symptoms noted were malaise and nausea, followed by vomiting and jaundice. The amount of

jaundice varied in intensity in different individuals. The temperatures were low in most all cases and the disease lasted about 2 weeks.

The first 4 cases occurred about a half a mile from the Town Dump and in a general way the remainder of the cases spread along the water course near which the dump is situated.—Lawrence E. Poole, M.D., Fairfield, Conn.

## LABORATORY

C. C. YOUNG, D. P. H.

### MANGANESE IN RIVER WATER AND ITS REMOVAL

PERKINS BOYNTON, F. A. P. H. A.

*Chemist in Charge, Clarksburg Water Board, Clarksburg, W. Va.*

DURING the last 10 years or so, in the section of the country including West Virginia and other soft-coal producing states, manganese has been found in increasing quantities in the river waters. Previously it was not a problem in water purification nor was it recognized apart from the other contents of a water removed by filtration or other treatment.

The writer left West Virginia in 1917, after operating the Clarksburg Filter Plant for 5 years, beginning about a year after the plant was started in 1910. In these 6 or 7 years, the sand, originally a nearly white bar sand, had grown a little darker, as was to be expected from the passage of coagulated, settled water. Upon his return to Clarksburg in 1924, he found that the filter sand was black in the beds, and of a dark brown color when dry. Soon after a brownish black deposit was discovered on the bowl of the Wallace & Tiernan Suction Type Chlorinator, which had been installed to feed the

filtered water within the last 3 years previous to that time. Chemical examination showed that the discoloration in the filter sand and the deposit in the chlorinator was due to manganese. Examination of the river and treated waters proved the presence of manganese in both, to the extent of 0.1–0.2 part per million. This amount was sufficient to darken the sand through continuous operation, that in the filtered water evidently being taken up from the sand grains.

The treatment at the Clarksburg Plant now consists of the addition of alum and lime, the latter fed to the raw water to increase alkalinity and to the filtered water to remove free  $\text{CO}_2$ . Softening is not usually attempted.

During the present drought, when the water was considerably harder than usual, it was decided to use up a supply of soda ash that was on hand. Although the plant is not equipped to soften water, 50 per cent of hardening constituents was removed—all sulphates,



alkalinity running nearly nil.

Frequent tests for manganese in both the raw and treated water began to show that while the manganese in the river water was increasing in the filtered water it had nearly disappeared. The run with soda ash was soon over, and as the continued drought caused the hardness and also the free  $\text{CO}_2$  to increase, hydrated lime was added beyond the amount necessary to make up the deficiency in alkalinity or to a phenolphthalein reaction of 7–10 (pH 8.3), with the result that, whereas the manganese in the river water has now

reached 2.0–2.4 parts, that in the water sent to the city is 0.0–0.1 part. This high manganese content is accompanied by 300 parts hardness, 30 parts free  $\text{CO}_2$  and alkalinity 0.0 to slightly acid. Iron is only 0.1 part.

The renewal of all sand and gravel in the 8 beds is contemplated this fall and it will be interesting to note the appearance of the sand from time to time and to check by analysis for manganese, if the above mentioned scheme of operation is followed at such times as the manganese is high or the necessary coagulation schedule will permit.

## VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

**Suicide Among Negroes in the United States**—Although negroes have a homicide death rate over eight times that of the white population, they comparatively rarely take their own lives. In 1927, the latest year for which general population statistics are available, there were only 373 suicides among negroes out of a total of 14,096 in the Registration States of the United States. This number gives a death rate of 4.1 per 100,000 population for negroes as compared with a rate of 14.1 for the whites. In other words, almost three and one-half times as many whites as negroes commit suicide.

But although relatively few negroes commit suicide, it is interesting to find that among the industrial policy holders of the Metropolitan Life Insurance Company the divergence between the suicide rates for white and colored people is not nearly so great as it is in the country at large. In 1927, the

standardized death rates were respectively 11.1 and 6.2 per 100,000 among the white and colored policy holders. The white rate was, in short, less than double the colored. Not only was the rate for insured white persons lower than in the general population, but the rate for insured negroes was distinctly higher.

At first sight, it appears rather disconcerting that 156 of the 373 negro suicides, or 42 per cent of the total, were in the insured group, although they compose only about one-quarter of the negro population of the country. But, upon analysis, we find two very good reasons for this discrepancy.

First, the negro policy holders of the Metropolitan are almost exclusively city dwellers. It is well known that throughout the world suicide is much more frequent in urban centers than in rural areas. Among the negroes as well as the whites, we find the same

differential in favor of those living in rural districts. In the Registration States of the United States in 1927, the urban rate was 9.6 per 100,000 for the colored as contrasted with 2.4 in the country districts. Nowhere is there more conclusive evidence of the favorable factors in rural living as regards suicide than in our southern states, for we find that suicide death rates for southern states, as a whole, are very low; whereas for the white population of southern cities they are strikingly high.

The second item which explains the higher suicide rates of negro policy holders is that those insured in the Metropolitan reside, for the most part, in the cities of the North. In fact, over two-thirds of the insured are found in northern cities. It is not surprising to find, therefore, that of the 156 suicides in the year, 118 or 75 per cent took place in northern cities. There is clearly a marked difference in status between negroes in the North and in the South. The unfavorable health situation of those who have migrated from the rural areas of the South to the great industrial centers of the North has been pointed out. Suicide rates would likewise seem to be affected by the disorganization which accompanies such movements of population. Thus, among negro industrial policy holders, in addition to the greater strain which urban life exerts, there is added the adverse effect on health and stability of a change from the South to the North. Our studies point to the conclusion that the mortality of the negro is better in the South and especially better in the rural districts of the southern states. This analysis of suicide frequency only adds to the strength of that conviction and explains why the suicide rate for insured negroes is so much higher than for the negro population as a whole.—Met. Life Ins. Co. *Stat. Bull.*, 11: 4-5 (Sept.), 1930.

#### MARRIAGE AND DIVORCE, 1929

*Alabama*—There were 29,430 marriages performed in Alabama during the year 1929, as compared with 28,853 in 1928, representing an increase of 577 or 2.0 per cent. In 1916, there were 25,453 marriages performed.

During the year 1929 there were 3,589 divorces granted in the state, as compared with 3,817 in 1928, representing a decrease of 228 or 6.0 per cent. In 1916 there were 2,265 divorces granted. There were 10 marriages annulled in 1929 as compared with 11 in 1928.

The number of marriages per 1,000 of the population was 11.3 in 1929, as against 11.2 in 1928; and the number of divorces per 1,000 of the population was 1.38 in 1929, as against 1.48 in 1928.

*Oklahoma*—Oklahoma reported an increase of 25.7 per cent in the number of marriages in 1929 over 1928, the actual number performed being 35,789 and 28,472 respectively.

During the year 1929 there were 8,252 divorces granted in the state, as compared with 7,762 in 1928, representing an increase of 490 or 6.3 per cent. In 1916, there were 3,693 divorces granted. There were 164 marriages annulled in 1929, as compared with 172 in 1928.

The number of marriages per 1,000 of the population was 14.7 in 1929, as against 11.7 in 1928; and the number of divorces per 1,000 of the population was 3.40 in 1929, as against 3.20 in 1928.

*Kentucky*—There were 30,474 marriages performed in Kentucky during the year 1929, as compared with 29,065 in 1928, representing an increase of 1,409 or 4.8 per cent.

During the year 1929 there were 4,592 divorces granted in the state, as compared with 4,610 in 1928, representing a decrease of 18 or 0.4 per cent. There were 8 marriages annulled in 1929, as compared with 13 in 1928.

The number of marriages per 1,000 of the population was 11.7 in 1929, as against 11.2 in 1928; and the number of divorces per 1,000 of the population was 1.76 in 1929, as against 1.78 in 1928.

*Kansas*—There was an increase of 6.9 per cent in the number of marriages performed in Kansas during 1929 over 1928; the actual numbers were 21,041 in 1929 and 19,679 in 1928.

During 1929, 4,127 divorces were granted, representing an increase of 1.1 per cent over 1928. There were 18 marriages annulled in 1929 and 28 in 1928.

The marriage rate per 1,000 population in 1929 was 11.2 against 10.6 in 1928; the number of divorces per 1,000 population was 2.20 in 1929, against 2.19 in 1928.

*Mississippi*—The Department of Commerce announces that, according to the returns received, there were 31,495 marriages performed in Mississippi during the year 1929, as compared with 30,263 in 1928, representing an increase of 1,232 or 4.1 per cent.

During the year 1929 there were 3,159 divorces granted in the state, as compared with 3,007 in 1928, representing an increase of 152 or 5.1 per cent. There were 7 marriages annulled in 1929, as compared with 3 in 1928.

The number of marriages in Mississippi per 1,000 of the population was 17.6 in 1929, as against 16.9 in 1928, and the number of divorces per 1,000 of the population was 1.76 in 1929, as against 1.68 in 1928.—U. S. Census Bureau, Preliminary Report.

#### Air Travel Fatality Statistics—

The Actuarial Society of America has published a report on aviation statistics which shows that travel by airplane is becoming safer, because the death rate among passengers is gradually decreasing. The report points out that there is not so much danger of accidents to

passengers riding with pilots with 400 or more hours of experience in the air as with pilots with less than such a number of hours' experience.

The death rate among pilots holding a license of the transport type was 79 per 1,000 for aviators having less than 400 hours of flying while the rate was only 29 per 1,000, or 63 per cent less, among those with at least 400 hours in the air.

While the passenger death rate on railroads in 1929 was approximately 1 per 300,000,000 passenger miles, the fatality rate in airway travel was about 1 per 1,250,000 passenger miles, or more than 200 times as hazardous as railway passenger service. The death rate of aviation passengers from January, 1927, through March, 1930, was 1 per 5,000 persons carried on scheduled air lines.

The number of miles covered by aircraft has an important bearing on the death rate among passengers. The records showed that in non-scheduled commercial flying the passenger fatality rate was about 2 per 100,000 persons carried, or about one-tenth of the mortality experienced in scheduled flying.

The experience of the U. S. Army and Navy pilots showed a death rate much lower for the year ending June 30, 1929, than did the best class of commercial aviators. The death rate of commissioned airplane pilots in the Army was 8 per 1,000 and in the Navy 10 per 1,000. The annual average for the last three years was 13 per 1,000 in the Army and 21 in the Navy.—*Canad. Insurance*, 35: 4 (Aug. 26), 1930.

#### MORTALITY STATISTICS, 1929

*Idaho*—The Department of Commerce announces that there were 4,075 deaths in Idaho during 1929 as compared with 4,177 in 1928.

The comparatively few causes of death which showed noticeable increases in 1929 as compared with 1928 were

meningococcus meningitis, which caused more than twice as many deaths, measles, cancer, diseases of heart, and cerebral hemorrhage and softening.

The principal decrease is in deaths from influenza (295 to 163), which alone more than offsets the decrease from all causes; other diseases which caused fewer deaths in 1929 than in 1928 were tuberculosis all forms, pneumonia all forms, diarrhea and enteritis under 2 years, and nephritis. Deaths from suicide and homicide also decreased considerably in 1929, and among accidental causes there was a fair decline in deaths from automobile accidents.

*Colorado*—There were 12,874 deaths in Colorado during 1929 as compared with 14,077 in 1928.

There was a decrease in the number of deaths in 1929 as compared with 1928 due principally to the lesser number of deaths from influenza and pneumonia. In addition, decreases were reported in the following causes: measles, scarlet fever, whooping cough, diabetes mellitus, diseases of the heart, and nephritis. The number of deaths from tuberculosis (all forms) has decreased continuously from 1926 to 1929.

Among the causes of deaths for which increases are reported are typhoid and paratyphoid fever, and diarrhea and enteritis of children. Deaths from homicide increased from 61 in 1928 to 90 in 1929.

The increase in the number of deaths due to accidental and unspecified external causes was due principally to automobile accidents, though increases were also reported in the number of drownings, accidental falls, mine accidents, railroad and street car accidents.

*South Carolina*—South Carolina has reported 23,053 deaths during 1929 as compared with 24,427 in 1928.

The most pronounced decrease in deaths in 1929 as compared with 1928 was for measles (from 299 to 4), and

next in importance was that from typhoid and paratyphoid fever, which also showed a remarkable and steady decline from 1926; other notable decreases from 1928 were from dysentery, diarrhea and enteritis under 2 years, pneumonia all forms; tuberculosis all forms, cancer, and congenital malformations and diseases of early infancy; pellagra, also, showed a slight decline, although it ranked among the highest eight causes of death in 1929, when there were 943 deaths as compared with 563 in 1926.

Generally considered, the increases in deaths were comparatively slight, and were shown most noticeably for whooping cough, influenza, diseases of the heart, and cirrhosis of the liver.

Deaths from accidental causes increased from 1,095 in 1928 to 1,161 in 1929, but this increase was much more than balanced by the increase in deaths from automobile accidents (from 251 to 350).

*North Carolina*—There were 36,919 deaths in North Carolina during 1929 as compared with 36,150 in 1928.

Practically all of the diseases which caused increases in the number of deaths in 1929 were also responsible for a greater mortality in the two years preceding. The causes for which this is true are scarlet fever, whooping cough, diphtheria, influenza, cancer and other malignant tumors, pellagra, diabetes mellitus, cerebral hemorrhage and softening, diseases of the heart, bronchitis, hernia, intestinal obstruction, nephritis, puerperal causes other than puerperal septicemia, suicide, homicide, and all kinds of accidents.

These continuous increases to some extent were offset by continuous decreases for the last 3 years in typhoid and paratyphoid fever, smallpox, measles, cirrhosis of the liver, and railroad accidents.

Most notable decreases from 1928 to 1929 appeared for measles, from 515

deaths to 20, and for diarrhea and enteritis, under 2 years, from 1,284 to 973.

Increases in deaths from 1928 were shown for whooping cough, tuberculosis all forms, diseases of the heart, nephritis, cerebral hemorrhage and softening, and influenza; this last cause increased from 1,567 to 2,304. Suicide and homicide also caused more deaths in 1929 than in 1928.

Deaths from accidents decreased from 1928 to 1929, the greatest reduction in number showing for burns and railroad accidents. The largest increases in deaths were those from shooting, falls, and automobile accidents, the last having mounted steadily and noticeably since 1926.

*West Virginia*—There were 18,128 deaths in West Virginia during 1929 as compared with 17,507 in 1928.

Marked increases are for whooping

cough, which almost quadrupled the deaths of 1929 from this cause over 1928, and influenza and dysentery, which practically doubled their mortality. These three causes were responsible primarily for the increase in the total deaths although less marked increases are shown for measles, diseases of the heart, pneumonia (all forms), and diarrhea and enteritis (under 2 years).

Decreases even though general were notable in scarlet fever, acute anterior poliomyelitis, tuberculosis (all forms), cancer and other malignant tumors, diabetes mellitus, nephritis, and homicide.

Among accidental deaths, decreases in 1929 were shown for drowning and shooting but these were nearly balanced by the increase in deaths from automobile accidents.—U. S. Department of Commerce. Bureau of the Census. *Provisional Summary: 1929.*

#### LARGE DEMAND FOR FREE SERVICE IN HOSPITALS

**N**ON-MUNICIPAL hospitals, dependent on voluntary contributions for support in order to provide free care for the sick poor, are having one of the hardest seasons in many years. Homer Wickenden, General Director of the United Hospital Fund, comprising 57 such hospitals in New York and Brooklyn, states that already a 10 per cent increase in the demand for free service has been noted in the hospitals, and that on the average a patient enters one of the 57 United Hospitals or its outpatient department every 30 seconds, and every 12 minutes an ambulance answers an emergency call. This demand

for free treatment is attributed largely to the current business depression, the lack of employment, the exhaustion of savings accounts, and inability to pay even in part for hospital care.

#### OUTDOOR RELIEF AGENCIES IN NEW YORK CITY

**T**HE people of New York City contribute nearly \$14,000,000 a year for the work of their "outdoor relief" agencies—organizations giving assistance to persons in their own homes. This is disclosed by a study of the income and expenditure of all local welfare agencies over the 17 years of 1910 through 1926 just completed by the Welfare Council of New York City.

# PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

**Iron Hydroxide Prevents Mosquito Breeding**—Observations by G. L. R. Hancock, in Uganda, record the antagonistic effect of flocculent ferric hydroxide upon mosquito breeding and discover other deterrents of the Anophelines. Senior-White showed that the presence of an oily scum and flocculent masses of iron hydroxide are associated with the absence of Anopheline larvae.

Natural waters were tested with the reagent of equal parts of concentrated hydrochloric acid and potassium ferrocyanide. A swamp showing between 10 and 20 p.p.m. of iron hydroxide (calculated as  $\text{Fe}^3$ ) gave negative Anopheline records. A tin of red soil was put into a water hole containing a large number of *A. gambiae*. The red soil raised the iron content of the well from 5 to 15 p.p.m., two larvae were found; a later observation, when the water showed 10 p.p.m. of ferric iron, revealed no mosquito larvae.

Another swamp containing flocculent iron hydroxide harbored *Culex* but no Anophelines. In a third swamp, not dominated by the sedgy plants Cyperaceae but containing iron hydroxide, only one Anopheline larva was found.

The observations suggest that a high concentration of iron, or some factor with it, is unsuitable for Anophelines, and indicate the possibility of controlling mosquito breeding by the addition of iron, perhaps in the form of red soils containing iron. The action of iron on plankton will obviously require study.

An oily scum which showed few bacteria proved to be composed chiefly of iron hydroxide. There are other iri-

descent oily scums of similar appearance associated with various organisms and inorganic substances. The influence of the flora and its correlation with the composition of the soil and water, as well as the rôle of phytoplankton, will need much study. Most of the swamps in which a large species of Cyperaceae is dominant appear to contain much flocculent red iron hydroxide precipitate and have yielded no Anophelines. J. Omer Cooper is of the opinion that the female mosquito does not exercise a great amount of discrimination but that the larvae fail to survive more from biological than mineral factors.

These observations suggest that mosquitoes may not be found breeding in pools in red clay or other iron-bearing soils, and that such earths added to ponds in gray loams may prevent the development of mosquito larvae. American investigations are needed.

Anopheline larvae occurred only rarely in association with shrimps along the lake shore. G. E. Hutchison stated that in South Africa places suitable for mosquitoes are often unsuitable for predacious water bugs, represented in America by such insects as the waterboatman, Notonectidae. Hancock observed that the small fish attacked the mosquito larvae only when the latter were in motion.—G. L. R. Hancock. *Bul. de la Soc. Royal Entomologique d'Egypte*, 1930. Abstr. H. B. Wood.

**Two Years' Study and Practical Use of Crank Case Waste Oil as a Mosquito Larvicide**—An account is given of experiments and field observations showing that crank case oil can be

efficiently used against mosquito larvae. The oil almost always requires straining, and apparatus for doing this is described. It does not in itself spread on water, but may be made to do so by the addition of a spreader such as tar acid (containing 25 per cent cresylic acid) or by adjusting the specific gravity of the oil to 32 or 34° Be. by the addition of light petroleum distillates.

Of these, one of the most satisfactory was found to be a waste product obtained from "varnolene," which is used as a solvent in the varnish industry, etc. It is a low boiling petroleum distillate and possesses the following specifications: Be. gravity 46.8°; flash point 96° F. closed cup; 160° F. open cup; boiling range 300–417° F. Like tar acid, it is itself highly toxic to mosquito larvae, whereas crank case oil is not. The lasting quality of the oil mixture is from 2 to 4 weeks, or twice as long as that of fuel oil, and the cost is about half that of the latter.

A method of calculating the amounts of the two oils to be mixed that are required to obtain a mixture of a given specific gravity is described.—J. P. Peterson and J. M. Ginsburg. *Proc. 16th Ann. Mtg. New Jersey Mosquito Exterm. Assn.*, Atlantic City, 1929, pp. 92–101. (From *Review of Applied Entomology*, Dec. 1929.) From *Pub. Health Eng. Abstr.*, Apr. 5, 1930. Abstr. V. M. Ehlers.

**Deratization of Milan**—It was decided that on a given day the deratization program should be undertaken simultaneously by the owners of buildings throughout the city.

Zinc phosphate (30 per cent solution in oil) was used as the active ingredient for the deratization of sewers, canals, public buildings, dumps, etc. For the deratization of dwellings, use was made of products which are less toxic to human beings (squill, *adonis vernalis*, *chelidonium* and *cynoglossum*). A solu-

tion of these active ingredients was furnished by the municipality at cost (5 lire for 50 baits).

On receiving the toxic solution, the householders were given a receipt on which printed requests were made for information regarding the number of baits devoured, the number of dead rats collected, and the presence of living rats following deratization. These cards were to be returned to (sanitary) inspectors.

Proprietors of factories, hotels, stores, etc., were left free to select their own measures of deratization but were required to report on the methods used.

The deratization was declared obligatory in all buildings including those where rats had never been observed. There are 22,170 buildings in Milan, covering a (estimated) surface of 6,000,000 square meters (exclusive of courtyards, gardens, etc.). It is estimated that one bait should be placed for each 2 square meters of surface. Actually, provision was made for the preparation of 4,500,000 baits.

It is estimated that only 2 per cent of the rats killed were found on the surface of the ground, and that 20 per cent of the baits set out were devoured. On this basis the number of rats killed was several hundred thousand.

The campaign is being continued, efforts now being directed toward the rat-proofing of buildings.—Georges Tron. *Rev. Hyg. Med. Prev.*, 51: 745–9. From *Pub. Health Eng. Abstr.*, Apr. 5, 1930. Abstr. Emery J. Theriault.

**Digestion of Activated Sludge**—The city of Pomona has a very ingenious way of conserving the cost of sewage treatment. A 20-year contract was made with the Northside Water Company of Walnut, Calif., to use the effluent from the activated sludge plant. The company agreed to pay one-half cent per inch-hour from October to

April, and one cent per hour for the remaining 6 months. All of this water is subsequently sold for irrigation purposes. In addition to this revenue Pomona charges two small cities for treating their sewage, sells water from a paper mill, and leases the sewer farm. The revenue comes from the following sources:

Sale of effluent (disposal plant)	\$4,669
Sale of sludge	414
Claremont, LaVerne income for sewage treatment	1,389
Sale of paper mill water	1,652
Lease of sewer farm	1,500
	<hr/>
	\$9,624

A study was made of pumping sludge from the activated sludge plant into the digestion chamber of the Imhoff tank. Experience showed this was not a satisfactory method. Sludge came up in the flowing-through chambers, completely destroying the action of the Imhoff tank. Greatly improved results were obtained by diluting the activated sludge with raw sewage, influent, to the Imhoff tank.

The author of this article mainly discusses costs of operation, and makes a plea for conservation of sewage effluent for irrigation purposes.—F. H. Froehde. *Calif. Sewage Works J.*, 2: 1, 1929, pp. 82–87. From *Pub. Health Eng. Abstr.*, Apr. 12, 1930. Abstr. M. S. Foreman.

**Chlorination of Water**—A skillful and careful review of the existing knowledge of the practice of water purification, both in America and Europe, and of its hygienic significance. This is supplemented by the results of well planned sets of experiments by the staffs of the Central Public Health Laboratory and of the Water Supply Bureau on the dosage and period of contact necessary for disinfection with chlorine and on the taste resulting from various chlorine dosages applied to a typical dune water. The taste experi-

ments show how widely different individuals, and even the same individual at different times, may vary in capacity to detect low chlorine dosages (less than 0.1 p.p.m.). Applications to swimming pools and sewage are included. The references to the literature are valuable.—A. Masink. *Government (Holland) Water Supply, Bu. Bull. No. 5*, Apr., 1924. From *Pub. Health Eng. Abstr.*, May 3, 1930. Abstr. Frank Hannan.

**Experimental Sewage Treatment Work in Europe**—In Europe, and particularly in Germany, a great deal of experimental work on sewage treatment is in progress. Activated sludge treatment using the submerged contact aerators, with mechanical paddles in combination with compressed air, is being tried by many cities. Phases of the work receiving particular attention are: The rotation of sludge to hasten sludge digestion and increase gas production; heating the digesting sludge and the collection of gases. In Great Britain a great deal of work is being done on re-aeration of activated sludge. The city of Paris is carrying on experimental work to determine the type of activated sludge plant to be constructed in the future.

Brief descriptions are given of eight interesting plants in Germany, three in Great Britain and one in France. The city of Berlin is constructing a 48 m.g.d. plant which will be operated on a large scale experimental basis.—G. P. Edwards. *Water Works & Sewer.*, 77, 3 (Mar.), 1930, pp. 89–92. From *Pub. Health Eng. Abstr.*, May 10, 1930. Abstr. J. B. Harrington.

**Can Tastes and Odors be Removed from Highly Polluted Waters?**—Data are presented to show that highly polluted water, i.e., 10 to 20 thousand bacteria per c.c., can be made sterile and entirely free from ob-



jectionable tastes at an estimate of from \$2.00 to \$5.00 per million gallons, exclusive of the cost of clarification.

Baylis believes that the use of ammonia and potassium permanganate for taste prevention is limited. Activated carbon is recommended for dechlorination and taste removal. The author's opinion is that super-chlorination followed by dechlorination with active carbon will produce the ideal testing water.—John R. Baylis. *Water Works Eng.*, 83, 4 (Feb. 12), 1930, pp. 227-228 and 236. From *Pub. Health Eng. Abstr.*, May 17, 1930. Abstr. A. C. Janzig.

**A Recent Development in Lime Water Softening**—This article describes a method of reducing carbonate hardness of water by lime softening to the theoretical or approximately to the theoretical limit. The process comprises adding to the water sufficient lime ( $\text{CaO}$  or  $\text{Ca.OH}_2$ ), to combine with the free and half-bound carbon dioxide and to precipitate the magnesium hydroxide. Considerable lime (25 to 50 p.p.m.) in excess of that theoretically required to replace the magnesium must be added to convert the magnesium salts in the water to magnesium hydroxide. This leaves excess lime or caustic alkalinity in the water. After partial settling the excess lime is neutralized with carbon dioxide, then calcium carbonate, water softening sludge or other inert finely divided material is mixed with the water, after which settling or filtration takes place.

Laboratory experiments at the Columbus water softening and purification works indicate that results far more satisfactory than by the present method may be obtained, that the process will not require close supervision and that it will dispense with filtration difficulties and produce water with perfect chemical balance.—Charles P. Hoover. *Water Works & Sewer.*, 77, 3 (Mar.),

1930, pp. 103-104. From *Pub. Health Eng. Abstr.*, May 17, 1930. Abstr. J. B. Harrington.

**Water Service in Holland**—The present development of public water supplies in Holland is described with much valuable detail. The history is briefly outlined. The peculiarities of Holland, geologically and hydrologically, are explained. A few of the leading features of the paper follow, but those interested in the history and development of water service would do well to possess themselves of the original.

Of the 7.4 millions of inhabitants in January, 1926, 4.6 are served by 111 public water supplies, of which 80 (72 per cent) are publicly, and 31 (28 per cent) privately, owned. Of the 390 towns and communes served, 45 depend on surface sources, 110 on dune water, 228 on other ground water; the remaining 8 on combinations of these.

Nearly one-half of the country lies below the one metre contour line (above mean sea level at Amsterdam) and would of course be inundated at every high tide and by every flood in the rivers but for the dunes and dykes. A result of the peculiar conditions is that under all the low area except in the dune district water is encountered quite near the surface the salt in which exceeds 400 p.p.m., the limit for acceptable drinking water. Suitable drinking water is therefore scarce over large districts and rural public supplies have been established on a large scale. For instance, the Province of North Holland has 96 communes combined in one large undertaking; the Leeuwarden District supply embraces 12 communes; the S. Beveland Island supply, 24 communes; Tholen, 7; North-west Brabant, 24; South Lunburg, 18.

The 4.6 millions of persons supplied in 1925 used 150 million cu. m. of water; or an average of 89 litres per capita daily, a remarkably low figure.

The average consumption in the eight largest cities varied from 116 litres in Rotterdam to 53 in Haarlem.

The Amsterdam waterworks, the first in Holland, was constructed by English engineers in the year 1853. The Government Water Supply Bureau dates from 1913. The functions are described. On its files are the data of over 18,000 boreholes; over 30,000 soil samples; and about 8,500 water analyses. The composition of four typical waters, those of Rotterdam, Amsterdam, Utrecht and Heerenveen, are given with some detail. Marked improvement in the typhoid situation has resulted, notably in the ten districts, from the introduction of reliable drinking water.

The paper concludes with a discussion of water tower architecture, with illustrations of three desirable models. Two maps and seven graphs are given; also two figures illustrative of equilibrium conditions between fresh and salt ground water, first thoroughly worked out by Herzberg at Nordnervey in 1901, and later by Pennink, a former director of the Amsterdam waterworks. The original discovery of the important governing principle which generally goes by Herzberg's name is claimed by the Dutch military engineer Yhybon in the year 1889.—F. A. Liefcrinck. *Wasserkraft u. Wasserwirtschaft*, 1927, Nos. 10, 11, 13, and 14. From *Pub. Health Eng. Abstr.*, May 3, 1930. Abstr. Frank Hannan.

**Oil Exclusion and Removal**—Exclusion of grease and light oils from sewer systems is a problem that has received very little consideration, and particularly from the designers of sewer

systems. The grease problem at Los Angeles is quite a difficult one on account of the usual grease wastes, viz., preparation of foods and soapy effluent from laundries, these combined with the wastes from petroleum products, and the waste from a large number of garages.

It has been estimated that the one million people connected to the Los Angeles sewer system contribute 22 tons of grease per day. Practically all of this grease comes from individual house connections. Grease traps, properly maintained, have been suggested as a possible remedy to exclude grease.

Laundries are particularly objectionable because of the slow deposit of thin layers of oily material on the inner surface of pipes. This material accumulates and hardens and is difficult to remove. It has been observed that when laundries are located along large sewers little trouble is experienced, due to high dilutions.

Periodically, large quantities of black oil appear at the ocean screening plant. This oil is very detrimental to sewer screens, causing blinding, and can be removed only by steam. A city ordinance prohibits the wasting of oil in the sewer, but it is a difficult problem to enforce it.

A very dangerous situation is produced by the discharging of gasoline and other light oils into the sewer. Explosions have occurred recently where 30 manhole covers have been blown as high as 25 feet, due to explosive gases. The city is combating this problem by use of a gas detector.—F. A. Batty. *Calif. Sewage Works J.*, 2: 1, 1929, pp. 78–81. From *Pub. Health Eng. Abstr.*, Apr. 12, 1930. Abstr. M. S. Foreman.

# INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., PH. D., AND LEONARD GREENBURG,  
M. D., PH. D.

The Health of the Worker of Today—After half-a-century's operation of the Public Health Service Acts the longevity of the race has increased 10 years (British Isles). The war came and instead of the results improving the condition of the working classes, the reverse has been the case. We find ourselves an overtaxed people, carrying an increasing burden of unemployment. We have not tackled the problem of regaining our lost markets diligently as have France and Belgium who now enjoy more prosperity and less unemployment.

The Controller of the Insurance Department of the Ministry of Health, Sir Walter Kinnear, reports that in a group of 500,000 insured persons he found, on comparing the experience of 1927 with the year of 1921, that in 1927 the claims of male members had risen by 41 per cent, those of unmarried women by 60, and those of married women by 106 per cent. In 1921, 14 out of every 100 men claimed sickness benefit; in 1927 the proportion had risen to 23. Among unmarried women the respective proportions were 12 and 21, and among married women 19 and 38. One hardly sees why, with all the efforts which have been made to improve the health of the community, claims of illness should have increased by 60 to 100 per cent within the space of 6 years. It is a fact also that the claims are out of all proportion to the increase in unemployment. Alderman H. J. Blake-way also states that within the last 30 years the average duration of sickness has increased from  $16\frac{1}{2}$  days to 28, and this without there being any

marked percentage increase in the number of claimants. Of 2,260 cases submitted to the Medical Referees under the National Insurance Act, 1,034 were at once cleared off the funds of the society. This circumstance of itself suggests the necessity of the exercise of greater care in furnishing and repeating medical certificates of unfitness.

The author next discusses the apparent increase of disability in various industries such as cotton weaving, coal mining, cutlery, etc. Among coal miners nystagmus has considerably increased in the last three decades. Since it has now been found that the malady attacks men working in brightly illuminated mines, there is clearly something more required to cause it than defective illumination, as proclaimed by the late Professor Snell, of Sheffield. Dr. Robson of Cardiff regarded carbon monoxide as the cause, but several analyses have shown this gas to be absent. It is now suggested that it might be of microbic origin. It is interesting to note that 25 per cent of the miners affected with nystagmus do not know that they are the subjects of it.

Formerly a high death rate of comparatively young men occurred in the Sheffield cutlery trades from pulmonary disease and tuberculosis. Likewise, in the pottery trades and the manufacture of lead products. These have now lost to a great extent their evil name and we can therefore claim that industrial hygiene and preventive medicine have not only averted a considerable amount of probable suffering, but have warded off death. Among ship builders within the last 15 years the longevity of the

men has increased 5 years—from 53 to 58.2 years.

In summary, while conditions have materially improved in a half century's time, the one circumstance which stands out prominently and calls for special comment is the lengthened duration of sickness and convalescence.—Sir Thomas Oliver, *J. State Med.*, 38, 8: 454-463 (Aug.), 1930.—E. R. H.

### Cokemen and By-Product Workers—Their Complaints and Maladies

—Coking of coal goes back as far as 1590 when a patent was granted to John Thornborough, a Dean of York. The original "bee-hive" ovens have now been replaced by "retort" and "by-product" ovens. In the first condenser, tar becomes deposited from the fumes passing from the ovens and, in the second, the ammoniacal liquor is caught. In a further scrubbing benzene is removed. When the remaining material is distilled, the tar, having yielded up fuel oil, becomes pitch. Ammonium sulphate is made by adding sulphuric acid. Further by-products can be obtained such as toluol, naphthalene, pyridine and motor spirit (benzol).

There are employed at coke ovens and by-product works in England and Wales 15,000 men. For the past several years the impression has prevailed that these men suffer disproportionately from stomach troubles, while they are also prone to rheumatism, lumbago, skin eruptions, and warts—the latter frequently taking a malignant turn. The gastritis reported begins at any age and at any period of service and is severe enough to cause the men to lay off, when remissions in the stomach trouble occur. The trouble appears toxic and is accompanied with a sense of fatigue which is out of proportion to muscular work performed. Stomach ulcers ensue in a considerable number of men. They have a sallow complexion and lose considerably in weight. The skin affec-

tions occur on the backs of the hands and forearms, scrotum and penis, also on the brow and eyelids. Bronchial catarrh is common, as might be anticipated from the exposure to heat and cold.

Twenty years ago, Sir Thomas Legge drew attention to the fact that blast furnace tar and pitch did not possess the same cancer producing qualities as those from coal tar. The pitch obtained from coke ovens and gas works and used for making briquettes is said to be the cause of more than one-half of the notifiable cases of cancer in Great Britain. Drs. Bridge and Henry found that, between 1920 and 1927, of 163 cases of cancer occurring in briquette workers, 11 per cent were located on the scrotum, 72.2 per cent on the head, arms, etc., while in 103 cases in tar distillers the malady showed itself in 39.8 per cent in the scrotum, and 37 per cent on the head, limbs, etc., and in men employed in gas works the disease was located on the scrotum in 47.3 per cent, and on the head and elsewhere in 23.6 per cent.

The particular points in the course of transit of the material where the men apparently suffer in health more than at other points are the top-oven men, the hydraulic mains men, the valve men, and the men who break up the solid pitch—these are all liable to adverse influence by dust, heat, and fumes.—Sir Thomas Oliver, *A Report by The National Union of Cokemen and By-Product Workers, Red Hill Villa, Durham, England*, 8 pp., Apr. 16, 1930.—E. R. H.

**Outbursts of Carbon Dioxide in Mines**—The disaster in which 150 men were suffocated in a Silesian mine has just been reported. The accident was apparently due to the penetration into a mass of disintegrated coal charged with carbon dioxide which then filled all the workings. Professor J. S. Hal-

dane in a letter to the *Times* points out that while such outbursts of carbon dioxide are unknown in Great Britain, they were described more than 30 years ago in the Gard district of France and have since occurred in Silesian and other coal fields.

In one instance the gas and coal dust shot high into the air and for a long time discharged like a volcano. Being heavier than air it came back, spread along the ground like water, and reached a village a kilometer away where it suffocated fowls and dogs, but the level at this distance was too low to kill human beings.

J. I. Graham, Mining Research Laboratory, University of Birmingham, has shown that coal in the presence of even a moderate pressure of gas will absorb a large volume of it from which enormous outbursts may occur. In British mines several lives have been lost through sudden outbursts of methane from disintegrated coal, but these are not so dangerous as outbursts of carbon dioxide.—London Letter, *J. A. M. A.*, 95, 8: 605 (Aug. 23), 1930.—E. R. H.

**Glasses for Protecting the Eye from Glare**—The federal specifications for the protection of eyes of industrial workers from injurious radiation specify that "shade No. 3, filter lenses are intended for glare of reflected sunlight, from snow, water, roadbeds, roofs, sand, etc." The mean transmission of visible light through a shade 3 glass is 13.9 per cent. The specification requires a fairly high absorption of ultra-violet and infra-red rays, which means that the color of the glass is greenish.

The next lighter shade is 2, with a maximum transmission of 60 per cent, but there is no provision in the Safety Code for the use of such a light shade. This is partly owing to the fact that no chances are being taken of possible injury, with attendant legal complications

regarding compensation for alleged injury. Personal experience on mountain elevations, etc., in the West indicates that a shade 3 glass is necessary to relieve the discomfort from glare.

The author has been confronted with the problem of newly exploited eye glasses that come and go like the style of hats and dresses. Amethyst-colored glasses transmit almost as much of the ultra-violet and visible rays as the white crown glass generally used in spectacles. While attractive in appearance and a good sales proposition, the author could not learn of any real advantage over the ordinary spectacle glass.

The nearly colorless glasses put on the market in recent years are of two general classes such as (1) "Softlite" and "Velvetlite" which are transparent to ultra-violet rays to practically the same extent as white crown spectacle lens, and (2) "Cruxite" and "Vio-pake"—all of these glasses have practically the same transmission as common spectacle glasses for the infra-red rays. They transmit some 85–90 per cent of the visible rays as compared to 91 per cent in white crown lenses when perfectly clean, and some 85–90 per cent as commonly worn. They offer no protection from the glare of bright light as defined in the beginning of the paper.

Most reflecting surfaces, except snow and water, absorb a much greater amount of ultra-violet than the visible rays. Hence, we are concerned mainly with the glare of visible light and not the presence of ultra-violet radiation.

Aside from style, the purpose of prescribing these glasses is not clear. Cases are few in which it is important to reduce the intensity of average daylight. When, however, one is near ultra-violet ray lamps and sparks from induction coils dark glasses should be worn to protect the eyes from ultra-violet radiation. Unlike the sun, these artificial sources are in the direct line

of vision and unavoidably shine into the eyes.—W. W. Coblentz, *J. A. M. A.*, 90, 8: 593–594 (Aug. 23), 1930.—E. R. H.

**Annual Report of the South African Institute for Medical Research for 1929**—This Report is, like its predecessors, of real interest. Studies have been continued on the subjects of plague, hay fever, tuberculosis, ancylostomiasis, the typing of pneumococci and meningococci. The Department of Industrial Hygiene has continued its studies on the subject of silicosis, chiefly under the direction of Dr. Mavrocordato. Elaborate and most interesting studies on dental caries are enumerated, which should yield some most valuable information on this subject. The transmission of plague from rodent to rodent has been demonstrated in the plague research laboratory and, finally, detailed investigations on the subject of cancer have been pursued in the pathological research laboratory.

The report of the Routine Division is most interesting and enumerates the vast amount of work which this laboratory has performed, an amount too great to detail at this point.

This most interesting and valuable

report closes with a list of 22 papers published by various members of the staff.—South African Institute for Medical Research, *Annual Report*, year ending Dec. 31, 1929.—L. G.

**Sulphur Dioxide in the Air at the Pittsburgh Experiment Station of the U. S. Bureau of Mines**—Three hundred and four determinations of the sulphur dioxide content of the outdoor air at the Pittsburgh Experiment Station of the U. S. Bureau of Mines were made between August 11, 1927 and 1928. An average amount of 0.16 p.p.m. was found. The maximum amount found, 1.1 p.p.m., existed on 2 days, and less than 1/10 p.p.m. (the minimum detectable amount) was observed on 141 days. The most frequently encountered value lay between 0.1 and 0.4 p.p.m., an amount found on 134 days. The direction of the wind was not found to be a significant factor in altering the concentration of sulphur dioxide in the air: The concentration was found to decrease with higher wind velocities and to be high on foggy or smoky days.—E. G. Meiter and C. E. Traubert, Department of Commerce, U. S. Bureau of Mines, R. I. 3005, June, 1930.—L. G.

# FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

**Effects of Ingestion of Tartrate or Sodium Aluminum Sulphate Baking Powder upon Growth, Reproduction and Kidney Structure in the Rat**—Many investigators have studied the adsorption of aluminum by the animal body after the ingestion of its salts and the effects on digestion and health of aluminum baking powders. This paper reports the results of sodium aluminum sulphate-calcium acid phosphate baking powder and cream of tartar baking powders on white rats, 30–50 gm. weight at the beginning of the experiment.

Commercial baking powders representing the two types were used. These were first mixed with water until reaction took place, heated, dried, ground, and mixed with food in amounts equivalent to what would ordinarily be contained in biscuits made according to recipes advocated by the manufacturers. The largest dose of S.A.S. baking powder represented 4 mg. aluminum per rat per day.

The ingestion of S.A.S. baking powders in amounts up to a dosage represented by 2 per cent of the diet and the ingestion of tartrate baking powders in amounts up to 4 per cent of the diet showed no marked injurious effects. Six generations were raised on rations containing approximately 2 per cent of S.A.S. baking powder for the first and second generations and 4 per cent for the succeeding generations. The rate of reproduction, the number of young successfully weaned and the rate of growth showed that the ration containing this baking powder is equal to similar rations containing none.

Microscopic examination of the kidneys of the animals fed according to the manner described in this paper failed to show that the length of time during which the feed was consumed or the proportions of the ingredients of the food itself brought about any pathological changes. The kidneys of the rats fed for a period of 21 months on the ration containing 2 per cent S.A.S. baking powder presented no microscopic lesions whereby they could be distinguished from the kidneys of the rats receiving the basic ration containing no baking powder residue.—J. F. Lyman and Ernest Scott, *Am. J. Hyg.*, 12: 271 (July), 1930.

**Effects of the Habitual Use of Tartrate and Aluminum Baking Powders upon the Utilization of Food in the Rat**—Reference is made to the fact that the literature records only one experiment on the effects of baking powder on the utilization of food and that is the report of the Referee Board of Consulting Scientific Experts, *Bulletin 103*, U. S. Department of Agriculture. This was on human subjects who ingested baking powders containing salts of aluminum over a period of 130 days. When the intake amounted to 200 to 260 mg. of aluminum per day mild catharsis resulted but there was little or no effect on the utilization of food.

In the present experiment, albino rats were fed their respective diets for a period of about 15 months when the effects on digestion were determined. Commercial powders were employed, one a tartaric acid-tartrate type, and

the other sodium aluminum sulphate-calcium acid phosphate.

Powders were moistened, heated, and dried, ground and mixed with an adequate control diet supplemented by cod liver oil. The tartrate residue was mixed with the diet in proportions corresponding to 1 gm. of baking powder to 25 gm. of food, and the S.A.S. residue was mixed so that it represented 1 gm. of baking powder to 53.5 gm. of food. Each proportion represented the amount which would be present on a calorie basis according to recipes of the manufacturers.

The digestion periods were of 10 days, and there were recorded the composition of the diet, food consumption, feces production, and weight of animals. The determination of digestibility coefficients indicated that rats fed over this long period on baking powder residues showed no effects on digestion and no cathartic action was observed.—Ruth M. Kraft, *Am. J. Hyg.*, 12: 283 (July), 1930.

**Vitamins in Dried Fruits. II. The Effect of Drying and of Sulphur Dioxide upon the Vitamin A Content of Fruits**—A previous report (*A. J. P. H.*, 29: 1053, Sept., 1929) of these investigators on the protective action of sulphur dioxide on vitamin C in peaches led to the conclusion that a similar effect might be found in vitamin A. Reference is made to the recent reports on the destructive effects of sulphur dioxide on the vitamin A in cod liver oil as compared to the same vitamin in butterfat and alfalfa and the varying results of experiments on vitamin A activity in purified carotene crystals which may be explained by the variations in catalytic or oxidative action rather than a fundamental difference in the vitamin.

In the present experiment, California prunes, peaches and apricots were employed. Dried fruits were stored at 0°

and the fresh fruit was ground and frozen. The SO<sub>2</sub> content of dried fruit was determined by the A. O. A. C. method as well as the pH of fresh and rehydrated fruit.

Rats 21 days of age were placed on a vitamin A-free diet supplemented by 0.5 gm. dried yeast per rat per day. The fruit was fed generally in 3 or 4 doses per week and was begun after the appearance of vitamin A deficiency, usually after 25 to 35 days. The fruit-feeding period lasted 56 days. The standard for feeding was the amount of fruit which produced an average weekly gain of 6 to 8 gm.

Tables show the percentage of vitamin A retention calculated on the standard of 100 per cent vitamin A content of fruit. This is based upon the dose of frozen, fresh fruit which permits at least 6 gm. gain for 8 weeks and is regarded as representing 100 per cent vitamin A content of fruit. Similar units were employed for dried fruit calculated to its fresh fruit equivalent, and the ratio between the weights required represents the vitamin retention. On this basis sulphured peaches, both dehydrated and sundried, retained 86 to 100 per cent of vitamin A in the fresh fruit and the unsulphured, sundried fruit about 90 per cent. The unsulphured, dehydrated product apparently lost about 50 per cent.

Yellow peaches were found richer in vitamin A than white varieties and there was a correspondingly less loss with this fruit whether sundried or dehydrated. Sulphured prunes showed somewhat greater retention than the unsulphured and the dehydrated sulphured 50 per cent greater retention than the sundried sulphured prunes. The lye-dipping of prunes apparently was without effect on vitamin A.

Apricots were found especially rich in vitamin A both in the fresh and dried fruit. This appears to be a governing factor in retention which was found to



be somewhat greater in the sulphured product. The vitamin A of apricots is apparently easily affected by drying since only 16 to 51 per cent of the fresh fruit value was retained, but with this loss apricots contain more vitamin A than the best of the peaches and prunes. The unusual richness in vitamin A in apricots is noted in connection with the hemoglobin regeneration effect of dried apricots reported by other investigators. The vitamin A content of apricots compares favorably with the best figures reported for spinach, egg yolk and butter.

Dried prunes and apricots were retested after storage at 0° for 12 to 14 months and results showed practically the same as before storage.—Agnes Fay Morgan and Anna Field, *J. Biol. Chem.*, 88: 9 (Aug.), 1930.

**Cystine Deficiency of the Proteins of Garden Peas and of Potatoes—**A previous experiment (*J. Nutrition*, 2: 225, 1930) showed that the proteins of garden peas and potatoes were deficient in cystine. Because of the small number of animals used in the potato experiment and the cooking to which the peas were subjected, the experiment was repeated.

The garden peas were shelled, passed through a hand mill, dried at a low temperature and reground. The potatoes (Ohio Red variety) were boiled, peeled, riced, dried at a low temperature, and ground.

Tables are given showing the composition of rations. The experiment on potato proteins involved 8 pairs of rats and on peas, 9 pairs. Tables are given showing the weekly gains.

The experiment showed that the growth-promoting value of the proteins of these two foods is enhanced by the addition of cystine; hence, these protein mixtures are deficient in this amino acid. These experiments failed to support the assumption that the more complete of two rations will be consumed

in larger amounts.—Jessie R. Beadles, Winfred W. Braman, and H. H. Mitchell, *J. Biol. Chem.*, 88: 615 (Sept.), 1930.

**Cereals and Mineral Metabolism**—Ordinary foods except egg yolk have not been found to be potent in vitamin D. The severity of the experimental rickets used in testing cod liver oil and irradiated products suggests that with a less powerful rachitic diet some of the other foodstuffs might show at least a protective value in rickets.

The present work deals with wheat rations compared to oat rations on rats with adjustment of the calcium phosphorus ration. There were 4 groups in each series, 1 group in which the calcium phosphorus ratio was high, 1 in which it was extremely low, and 2 intermediate in which it approached unity.

Vitamin B was deemed sufficient since the rations both in the wheat and oats contained 60 per cent of cereal. Three per cent of butterfat was used to supply vitamin A. The experiments were conducted over a long period of time and in some instances as much as 135 days.

The results show that in the wheat series the growth on the high calcium phosphorus is relatively poor compared to the growth in the groups where the calcium phosphorus ratio approached unity irrespective of the amount of food consumed. In the low calcium phosphorus group growth was not so good as those in which the ratio approached unity which was better than in the high calcium phosphorus lot.

The rats on oat diet showed a similar relationship but in all cases the growth was not so good as with the comparable wheat group. The conclusion is reached that with mild rachitic rations such as in this experiment wheat contains sufficient vitamin D to protect against rickets and to permit spontaneous healing if sufficient time be given. The oat diet is less effective in spon-

taneous healing. Both experiments indicate the effectiveness of the calcium phosphorus ratio which appears optimum when nearest unity.

Reference is made to recent investigations showing that rolled oats is more rachitic than wheat and that calcium phosphorus retentions were higher on a wheat than on an oat diet. The author ascribes the differences in the wheat and oat diets to differences in variation of vitamin D content.—M. S. Fine, General Foods Corporation, *Cereal Chemistry*, 7: 456 (Sept.), 1930.

**Tooth Growth in Experimental Scurvy**—In this experiment the normal growth rate of the teeth of guinea pigs was determined. Animals were placed on the Sherman-La Mer basal diet with 1 per cent cod liver oil. During the test the animals were scored by the Sherman method for scurvy and weighed every 5th day.

At the conclusion of the experiment the animals were killed and the lower jaws, ribs, and extremities were studied histologically. The incisor teeth were checked at various levels for determining the degree of scurvy. The vitamin A supplements were contained in diets

of orange juice, tomato juice, turnip greens and mixed green vegetables.

On 5 c.c. of orange juice daily the rate of tooth growth increased and there were slight scorbutic lesions in the incisor roots but no scurvy evident by the Sherman score, which is based on the weight curve plus clinical observations as to pain, hemorrhage, etc. One c.c. of orange juice increased tooth growth but pronounced scurvy was found in the incised teeth. Tooth growth was scarcely increased on 0.5 c.c. orange juice, and advanced scurvy was present contrasted with the Sherman score of moderate scurvy.

Animals on the basal diet alone showed a tooth growth for the first 15 to 20 days which then ceased but recommenced after the administration of 5 c.c. of orange juice daily. By studying the appearance of scorbutic substances in amputated teeth compared to those uncut and subjected to normal chewing strain it was found that the stress is a definite factor in the scorbutic process. Photomicrographs show the changes in the odontoblasts and the formation of osteodentin.—Gilbert Dalldorf and Celia Zall, *J. Exper. Med.*, 52: 57 (July 1), 1930.

# PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.\*

**A Nursing Program in a County Health Department**—At the Conference of Health Officers and Public Health Nurses held at Saratoga Springs, N. Y., in June, Marion Sheahan, R.N., Assistant Director of the Division of Public Health Nursing of the New York State Health Department, in discussing "A Nursing Program in a County Health Department" gave a summary of the purposes of a nursing division in a county health unit:

1. Provide a supervisory service by a well qualified nurse or nurses to:

- (a) Direct the nursing activities of the county health department in order to relieve the county health commissioner of the detail in connection with the work,
- (b) Assist in outlining and maintaining an adequate program of work,
- (c) Aim to correlate the nursing services of the county,
- (d) Aid in placing qualified nurses in the field,
- (e) Introduce new nurses into various fields to insure standard work,
- (f) Outline and conduct staff education on a county-wide basis, offering this service to all nurses no matter by what agency employed,
- (g) Coördinate the nursing work of all agencies so as to utilize it to best advantage in promoting a county-wide health program under the direction of the county department of health,

2. Provide sufficient staff nurses to make service available to areas not covered by existing agencies. Also, offer assistance to local organizations, for example, in the event of communicable disease outbreaks, round-up of preschool children, tuberculin testing of school children, inspection of boarding homes, maternity homes, and similar activities.—

*Health News*, New York State Department of Health, pp. 147-148, VII, 37: (Sept. 15), 1930.

Pearl McIver, Director of the Missouri State Department of Public Health Nursing, in a paper read before the 1930 Conference of Indiana Health Officers at Fort Wayne in September, made some further points on the relation of the public health nurse to county health work. She said that educational work through individual and group instruction should occupy the largest part of the nurse's time. Rather too often we find a health officer who feels the chief duty of the public health nurse is to tag along with him and wait upon him much as a surgical assistant would in an operating room. "Some public health activities require the combined efforts of physician and nurse, but time is often wasted by too much 'joint work.'"

**Westchester County Shows the Way**—The Westchester County (N. Y.) Health Department and the Northern Westchester District Nursing Association have worked out a mutually helpful arrangement

... to provide the necessary regulation and instruction for cases of communicable disease in towns served by the association and that are under the direct supervision of the central office of the County Health Department. Local nurses in the association in these towns will visit all reported cases of communicable disease requiring legislation, to give instruction relative to isolation and concurrent disinfection and to post placards as provided by the State Sanitary Code. Epidemiological investigations will continue to be carried on by the County Health Department, which will

\* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

also offer consultation service for diagnosis, when desired.

A similar arrangement has been made with the local nurses in Hastings, Larchmont, Cortlandt and Greenburgh, where there are no local health officers.—

*The Link*, Westchester County Health Bulletin, 5, 7, p. 3: (Aug.-Sept.), 1930.

**Public Health Nurses in a Diphtheria Campaign**—An intensive diphtheria campaign was carried on in 2 districts in Detroit by a group of nurses in the Detroit Department of Health from July 2 to September 2. The parents of 23,748 children were interviewed, and 38.25 per cent of these had already had toxin-antitoxin; the nurses prevailed upon the parents of 39.39 per cent of these remaining to have it given.

It is significant to find that the intensive house-to-house canvassing resulted in the immunization of an appreciably larger proportion of younger and more susceptible children than did the general city-wide educational

campaign. For example, only 51.1 per cent of the children given toxin-antitoxin before the intensive work of this summer were under six years of age, while of those protected through the nurses' efforts this summer 67.4 per cent were under six years of age.—

**Age Distribution of Children Protected Against Diphtheria**, *Weekly Health Review*, City of Detroit Department of Health, Series 11, 38: Sept. 20, 1930.

It seems impossible to find the death rate from diphtheria in the 1-6 inclusive age group, but authorities agree that this is the group that needs toxin-antitoxin most for, as Lee says, "A large number of children have been immunized, but unfortunately most of this work has been done among the school children and very little among the pre-school population. Two-thirds of the deaths from diphtheria occur in the 0-4 age group."—Walter W. Lee, M.D., *Diphtheria, Its Treatment and Prevention*, A. J. P. H., XVIII, 10: 1246 (Oct.), 1928.

## EDUCATION AND PUBLICITY

EVART G. ROUTZAHN\*

**Exhibits at Fort Worth**—Health railroad cars, educational and technical or commercial exhibits as a whole gave but little evidence that use is being made of what we actually know about the planning and preparation of graphic material. The Harmon prize display of the New York Diphtheria Commission was excellent of its kind, and several educational-commercial displays were colorful and distinctive. Specific suggestions can be offered exhibitors upon request.

\* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

**People Who Can't or Won't Read**—Five million illiterates—who had "no schooling whatsoever"—reported in the census; one in four million and a half soldiers and sailors who did not show "ability to read and understand newspapers and to write letters." *They cannot read our newspaper articles, pamphlets, folders, leaflets, house organs—not even our posters.* What other means do we use for reaching them? Is it worth while to check up on illiteracy records—in our state or city—to determine where there is special need for unusual efforts to reach such groups?

A Useful Source Book—"Health Education in the Public Schools," by Anne S. Whitney; "Popular Health Education," by Ira V. Hiscock; and "Publicity in Social Work," by Mary Swain Routzahn, appear among 197 topical articles (nearly 50 on phases of public health) in *Social Work Year Book*, a new publication of the Russell Sage Foundation. \$4.00.

Those articles briefly state the history and present status; training requirements and opportunities; developments and events, 1929; and legislation, 1929, supplemented by reading references and descriptions of the interested national organizations. Doubtless the tentative classification of these national agencies, a useful feature, will be done better in the next issue of the *Year Book*. The present listings under health education and publicity include several not primarily concerned with these subjects and omit many others doing as much as most of those listed. A basis for selection is difficult to work out.

**Let's Start the Experiment Right**—The Committee on Administrative Practice has made another practical and forward-looking contribution. "For experimental use" the committee offers a set of forms for recording departmental activities. We hope those concerned with health education will join in the experiment. We suggest at the start that you consider a few changes.

In the first form—Cumulative Monthly Report—among the nine columns given to "Popular Health Instruction" are two headed "Health plays and motion pictures" and "Attendance." Health plays are *not* accounted for in the *Appraisal Form for City Health Work* on which this report form is based and so that item is out of place in the new record form. Moreover, plays may be considered an oc-

casional and incidental form of popular health education and the least of the forms to be conducted by a city health department.

Another column in this form is headed "Circulation of fixed publications." "Fixed publications" is not used in the *Appraisal Form*, and it is not an accepted term for any specific form of publicity. It would seem better to use words that carry over from some item in the *Appraisal Form*.

In the second blank form now offered—called a Summary of Activities for the Month—there is a heading for "Number of pamphlets distributed" for which there is no corresponding space in the preceding form.

In the introduction to the blank forms it is said of the Summary that "it is easily compiled each month from the Cumulative Report." But in the first form there is that space for the *combined total of plays and motion pictures*, while in the second form the corresponding blank reads "Number of *health films* shown"—that is, in some fashion the health officer will "easily compile" the figure for the number of motion picture showings out of a total made up of motion pictures and plays.

Of much less importance, doubtless, is the upper heading on page 25 of the first form: "Health Classes, Plays and Films." Why there should be this extra heading is not clear.

In neither of the blanks are there spaces for all of the items included in the *Appraisal Form*.

**Getting Health Workers to Read About Health Work**—The first month 126 magazines were requested—143 the second month—as a result of a mimeographed bulletin, "Selected Articles from Public Health Magazines," prepared by the Los Angeles County Tuberculosis and Health Association (132 West 1st St., Los Angeles), and issued

in the name of that body and of the County Health Department.

This list does not pretend to be a comprehensive index. Its purpose is rather to stimulate interest in current health material among health workers in Los Angeles County by bringing to their attention timely and readable articles.

A mimeographed reply blank is enclosed with every copy of the list. We hope that future issues will refer to this Education and Publicity department, and other departments in the *Journal*. We thank Prof. Ira V. Hiscock for bringing this excellent device to our attention.

**How "Old" Is the Reading Public?**—Under this title Robert R. Updegraff discusses whither "in our copy, are we over-shooting the mass mind?" The author tells of an especially popular high school textbook on ancient history and how the author of the book explained its popularity.

"Well," said he, "there is a perfectly good reason. That book was intended as a text for boys and girls 13 or 14 years of age. When the manuscript was finished, and before a single line of it was set in type, I paid a boy of 11 to read it and mark every word he did not understand. Then I went through the book and inserted simpler, understandable words or phrases for every word he had marked. Or I rewrote the sentence entirely in the interest of greater simplicity."

Mr. Updegraff tells of his own first published story, "Obvious Adam," which has sold up in the thousands through 15 years.

After the story was finished I went through it page by page, sentence by sentence, methodically challenging every word of more than two syllables. Wherever a shorter, simpler word could be substituted, it was done. The result was rather startling.

Four questions are suggested by the author to be raised before using "big" words:

1. Is there a simpler word that will do?
2. Can it be left out entirely by rewriting

the sentence in simpler form?

3. Will it mean to the reader what it means to me?

4. Will it go through the reader's mind as "just one of those words" or will it actually register something very definite?—

*Advertising and Selling*, 9 East 38th St., New York, N. Y., Sept. 17, 1930. 25 cents.

**Peas, Potatoes, Pumpkins**—The following from the *Daily Bulletin*, at Fort Worth, was prompted by program announcements at Fort Worth of various sessions in which all discussion of three, four or five papers in a session was combined after all the papers had been given:

Were you ever in a meeting for the discussion of the technique of successfully raising peas, potatoes and pumpkins—simultaneously?

Peas, potatoes, pumpkins; pumpkins, potatoes, peas; peas . . . what a mental porridge would result!

And what mental confusion must result when three or four papers presented in a convention program are discussed in the same period?

Program committees, please copy.

**Headquarters at Fort Worth**—For the first time in a number of years there was no Health Education and Publicity Headquarters at the Fort Worth meeting of the A. P. H. A. If acceptable space is provided at Montreal we will try again next October to bring together outstanding examples of health publicity and samples of materials of use to the publicity worker as has been the custom of this department.

**"Have You a Book?"**—Thus is headed a report in *The Survey* (Oct. 15, 1930) of a checkup of professional and general books and magazines read by social workers in Hartford, Conn.

Is it not worth while to give thought to the professional reading of staff mem-

bers and of all health workers in our city or state? Do we "all have a book"—and therefore do not give other books a chance to contribute to our professional equipment?

We can give details of the Hartford experiment if our readers are interested.

**When Editors Fear Their Readers**—Even yet some newspapers fear to mention syphilis and gonorrhea in their news columns. Some of the few which carry advertisements of quacks and nostrums will not mention the diseases by name in news articles.

When such a condition exists in a city it is suggested that a tactful man, sympathetic towards the editors' viewpoint, personally discuss the subject with the editors. The caller may go armed with information about what other newspapers and periodicals have done and what has been said on the subject in *Editor & Publisher*, the influential organ of the newspaper world.

Among the material available: the series of advertisements placed in the *Saturday Evening Post* by the American Social Hygiene Association; advertisements in daily papers of the New Jersey and West Virginia State Departments of Health; advertisements in Chicago dailies; discussion in *Journal of Social Hygiene*; discussion in *Editor & Publisher*. Doubtless the American Social Hygiene Association, 370 7th Ave., New York, N. Y., could provide typewritten copies of this matter.

Please report to this department examples of news mention, advertisements or discussion of the subject.

**Tests and Checks on Health Education**—Every scrap of information about any form of test or check on methods or materials is desired by the editor of this department. Please send in any clue to anything you know about or have read about even of the most informal nature. .

**The Challenge to the Publicity Worker**—Said President Hoover, in a message addressed to the School of Journalism, University of Missouri:

The greatest challenge to the ingenuity of journalists is to make these things (science, social advance, civic idealism) as interesting to the public as are the more familiar subjects which apparently must be treated in terms of conflict.

**Health Books for the Public Library**—"The Most Suitable Health Books for the Public Library" are discussed and listed by James A. Tobey and Raymond S. Patterson, in *Library Journal*, 62 West 45th St., New York, N. Y., Nov. 1, 1930. 25 cents.

The first test of a book on such an important topic as human health is its scientific accuracy. There is no room for fads and follies, nor for individualistic medical notions and opinions. The second essential characteristic is readability, together with a practical and reasonable presentation of important facts in an attractive style. A book for serious reading need not be a dull book. It should, moreover, avoid technical language and be clear, concise, and cogent, but thorough, logical, and diverting. There is plenty of romance in this adventure called health, in this drama which is the game of life. The books listed and described comply with the specifications, and others. They are arranged under six divisions, with, of course, an overlapping between them. As an introduction to the general subject, five books have been included under the caption, "The Background of Health." Perusal of these particularly entertaining books will result not only in an absorbing fund of useful information, but also in an adequate conception of the science called public health.

Selections from the copious quantity of books on baby care are conspicuously absent from the list on "Maternal and Child Hygiene." As in the case of the health habits, such material may be readily obtained in numerous reliable pamphlets and books issued by official and voluntary health agencies and by reputable commercial organizations interested in public health.

**An Effort to Check Results**—How can patients needing medical attention

be brought under treatment? Does popular health education really result in bringing under medical care persons infected with syphilis and gonorrhea?

For some years various types of health publicity have been used to induce persons to seek treatment and it has been assumed that such education has been effective. The results, however, have not been measured nor is there available data to show the value of different types of health propaganda.

Demonstrations are being carried on in New York, Chicago, and Boston with the object of finding out something about the value of various methods and materials used in health propaganda. The Bellevue-Yorkville Health Demonstration, the City Health Department, the New York Tuberculosis and Health Association and the American Social Hygiene Association are sponsoring the New York demonstration which is confined to the Bellevue-Yorkville area. This area is the district between 14th and 64th Streets on the east side of Manhattan, with Fourth Avenue as the western boundary below 42d Street, and Sixth Avenue above.

Lectures, motion pictures, posters, pamphlets in various languages are being used in a wide-spread effort to reach every section of the population. Hospitals, clinics, and doctors are co-operating by supplying the number of their patients under treatment for syphilis and gonorrhea before, during and after the campaign. These figures will give an indication of the value of popular health instruction, the object of which is to bring the infected under treatment. The demonstration will continue about three months, reaching its height in November.

Similar education methods will be employed in the Boston campaign which will occupy a part of several months; while the most intensive part of the Chicago campaign will be limited to one week.—Doris G. Chandler.

### Shop Talk and Working Tools—

Such will be found in every issue of the *News Bulletin* of the Social Work Publicity Council, 130 East 22d St., New York, N. Y. *Sample free.* The October, 1930, issue discusses "Come and See" visits and how to make more of them; mentions that the S. W. P. C. prize newspaper story, "Health and Charm at End of Rainbow by 15,000 Girls," was reprinted in the September issue of *Everybody's Health*, St. Paul (10 cents); that Association of Community Chests and Councils, 420 Lexington Ave., New York, N. Y., has albums of photographs by Hine, Myers & Moss (prints can be bought at modest prices); starts a discussion of how to secure bequests; explains that a few dates are open for convention or local visits by the collection of prize award publicity specimens; and describes numerous publicity specimens and ideas.

"Telling the Public"—Old truths are re-stated by Edith M. Ross, a county nurse (*Survey*, 112 East 19th St., New York, N. Y., Oct. 15, 1930. 30 cents):

Are most of us eye- or ear-minded? Do we notice more, do we remember better, what we see or what we hear? From my own experience, first as a county nurse, then in state work, I find that people remember better what I say if they can see at the same time something allied to the subject of my talk. Charts, especially in speaking to adults, always help. Tack maps are nearly always fascinating. There is something concrete, vital about them—something that takes away the intangibility of mere figures and brings facts home to us. Our public is far more hungry for information than we imagine. But we must be careful not to repel it by trying to feed it dull, dry, lifeless facts.

The staff nurses of the Minnesota Public Health Association, when they make school inspections, use a small cloth dog or monkey or a "Felix" cat to arouse the interest of the younger children. Into any of these, which consist of a head and forelegs, we run



the fingers of one hand. Then we get the children to ask it questions such as: "How many glasses of milk do you drink?" or "What time do you go to bed?" And the dog or cat or monkey, as the case may be, waves one paw slowly to indicate the number of glasses of milk he consumes or the hour at which he retires. He shows them, too, how he washes behind his ears, how he brushes his teeth. There are few health habits which these toy animals cannot help us expound. And when I return the following year, I find that what Coco, my monkey, or Milko, my dog, has told them has not been forgotten.

#### TRY ONE OF THESE?

"For 700 years traders have tried their cleverest advertising stunts on merchants who come annually to the Leipzig fair."—Caption under a photograph of a man with a big clock on his head. Probably makes the hands go round—or the alarm to ring. Try "Now is the time for a health examination(?)"

New displays of health pamphlets may be found in the lobby of the Health Department which is entered from Third Street. These include pamphlets about measles, cancer, smallpox, tuberculosis, diphtheria, heart disease, whooping cough, goiter, influenza, tonsils and adenoids, common colds, and the latest numbers of this Health Department's bulletins. In addition, there will be found in the Health Department up-to-date files of health magazines and health books which the Public Library does not keep. Pamphlets are free to individuals or in quantities to organizations. Books and magazines may be borrowed by signing up for them.

—Racine, Wis., Department of Health.

An effective "testimonial"—a letter of thanks from a client—is reproduced in facsimile, with the street address and the signature crossed out by pen—on a folder going with an appeal letter from the New York Diet Kitchen Association, 578 Madison Avenue, New York, N. Y.

The latest health tabloid is "North Harlem Photo News," issued by the Diphtheria Prevention Commission of the Department of Health, New York, N. Y. Includes "Harlem First to Have New Health Center," "Children, Rich

and Poor, Often Suffer from Lack of Right Food Says Expert," "Magic Rings of History," "The Inquiring Reporter" (who asks: Do you save money throughout the year for your summer vacation?), "Voice of the People," etc. 17 pictures. Much display type. *Free*.

The Diphtheria Prevention Commission and the Bellevue-Yorkville Health Demonstration have amply illustrated the possibilities in making health information and suggestions *look interesting*.

Some cities—or states—might try the idea in a 2-page form to reduce the cost.

#### MAGAZINE ARTICLES

"The Church and Birth Control," by Right Rev. Charles Fiske. *Atlantic*. Nov., 1930. "The Lambeth Conference marks a great departure."

"Doctor and Patient." *Nation*. Nov. 5, 1930. "The remedy . . . lies in the reorganization of the industry."

"Looking for Trouble," by Ruth F. Wadsworth, M.D. *Colliers*. Nov. 8, 1930. "Looking for trouble in order to avoid it, otherwise known as periodic health examinations. . . ."

"Mothers in Danger," by Ruth F. Wadsworth. *Colliers*. July 5, 1930.

"The Patient Looks 'at Doctors.'" Anonymous. *Harpers*. Nov., 1930.

"To Be Or Not To Be?" by Louis I. Dublin. *Harpers*. Sept., 1930. "The facts about suicide."

"Who Pays the Price?" by Frances Sage Bradley. *Mountain Life and Work*, Berea, Ky. Oct., 1930. 30 cents. A story presentation of need for maternity and visiting nurse services.

#### LANGUAGE

"Odds Bodkins" in *Advertising & Selling* quotes from Clyde Fitch:

This time you have realized exactly what I was striving for—honest simplicity of language and unconventional treatment of conventional situations.

## BOOKS AND REPORTS

**The First Year of Life**—By *Charlotte Buhler*. Translated from the German by *Pearl Greenberg and Rowena Ripin*. New York: The John Day Company, 1930. 281 pp. Price, \$3.50.

The translation of the researches of Prof. Charlotte Buhler and her associates upon the behavior reactions of the infant throughout its first year has made available to English readers the most elaborate and extended study of this age period that has yet appeared. It involves the continuous day and night observation for 24 hours of 5 children in each month of life and the meticulous recording of their behavior. The investigation was carried on for the most part in 1926 at the Reception Home for Children in Vienna.

Part 1 is devoted to a discussion of the negative, positive and spontaneous reactions of developing infants; the protocols carefully describing every movement and expression for a number of typical days are given in extenso. The time occupied by sleep, dozing, in taking food, in negative reaction, in quiet waking, in negative and impulsive movements, is graphically charted. An inventory of the observed behavior for each month of the first year is given.

In part 2, a series of tests is suggested which are intended to ascertain how the child develops in physical and mental control of himself, in social relationships and in the manipulation of materials. As a basis for the tests the inventory of behavior above referred to was used. The materials needed for these tests and the method of application are carefully described for each month of age.

The author is confident that these various tests may corroborate or re-

verse a casual judgment. Children thought to be retarded or accelerated in development were found to be so only apparently. Children socially responsive are usually thought to be abnormally bright, when complete testing indicates that they may be slow in manipulating material.

In a series of children retested after 6 months, the results obtained agreed with those in the first examination.

The book covers a difficult field. It is an attempt to estimate the potential capacity of the young infant. There is not infrequently a lack of clearness in expression due possibly to the effort of the translators to follow the original text too closely.

If the most important study of mankind is man, it is desirable that this study begin at the earliest possible age. This is the objective of these painstaking observations.

J. H. MASON KNOX, JR.

**Industrial Hygiene for Schools**—By *Jesse Feiring Williams and Delbert Oberteuffer*. New York: McGraw-Hill, 1930. 271 pp. Price, \$2.00.

This small volume has been designed for the purpose of indicating health problems in modern industry and for pointing out health guides for general living to young men and women who are about to enter industrial life. That this has been achieved there is no doubt, for a large number of the problems of industry are discussed, at least, briefly. Perhaps the greatest defect of the book lies in the fact that many of the discussions are so brief that the content has suffered "by compression"; the sections devoted to the subjects of ventilation, dusts and poisons are examples of this. The chief virtue of the

book lies in its scope and the many excellent illustrations which serve to enhance interest in an already very readable volume.

LEONARD GREENBURG

**Dictionary of Biological Equivalents. German-English—By Ernest Artschwager. Baltimore: Williams & Wilkins, 1930. 239 pp. Price, \$4.50.**

This dictionary gives the equivalent in English of about 15,000 German scientific terms of general use in the biological sciences. It is somewhat more complete in the botanical, pathological, and anatomical fields than in the zoological and physiological. The plates illustrate a few morphological details of plants and animals. Useful lists of common German abbreviations, of irregular verbs, of metrical equivalents, of important reference books, and of related dictionaries supplement the verbal ones.

The utility of this work lies in the fact that the smaller German-English dictionaries rarely contain the definitions of the compounded scientific words and the assembled definitions of the elements do not always reveal the meaning of the compound. This compilation is thus a time-saver and a convenience for the biologist.

C. A. KOFOID

**Artificial Sunlight—Combining Radiation for Health with Light for Vision—By M. Luckiesh, D.Sc. New York: Van Nostrand, 1930. 254 pp. Price, \$3.75.**

In this book, the author, who is recognized as an authority upon the subject of light, has brought together in readable fashion a great variety of data concerning the effects of radiant energy and the physics of the subject. A perusal of this work should temper irresponsible and enthusiastic imagination, which too often has been the basis

of claims made for the benefits of light in the ultra-violet region.

A real justification for an authoritative reference book of this sort is offered in the following quotation: "Quackery flourishes in the twilight zone of knowledge. Likewise something closely akin to it develops during the same period—practices based upon unquestionable sincerity but lacking adequate knowledge of the nature or of the effects of the alleged remedy." With so complete and so readable a source book as is furnished by Dr. Luckiesh there now seems no longer any excuse for exuberant and unjustified expectations regarding the value of light.

The author presents logical reasons for his expectation that a new type of lamp described extensively in this book will supply a combination of radiations for health and for vision. If this new lamp is as meretorious as is the large body of convincing scientific experimental data adduced in support of its design, it may indeed be the introduction to an era in which "artificial sunlight can be more than a safe and unfailing substitute for a midday, midsummer sunlight during the entire year."

The book is attractively printed and arranged and reasonably well indexed.

JOHN W. M. BUNKER

**Trauma, Disease, Compensation—A Handbook of Their Medico-Legal Relations—By A. J. Fraser, M.D. Philadelphia: F. A. Davis Company, 1930. 506 pp. Price, \$6.50.**

The tendency of present-day compensation acts is undoubtedly to make more liberal provision for accidents and diseases occurring in industry. Increased knowledge of compensation laws and their provisions on the part of workers and lawyers has had the effect of bringing suits for compensation of all kinds which have never before been brought into court.

The effect of these forces has been

to increase the number of cases of all kinds and the types of these cases continue to present new, interesting, and difficult problems for solution by the medical expert and the compensation commissioner.

The volume at hand is essentially a compilation of compensation decisions and medical opinions concerning injuries and diseases of all the organ systems of the body. The final chapter is devoted to rating schedules for the apportionment of permanent disability.

The effects of trauma may be localized or general. They may be manifest in the traumatized region or at some more distant point. The effects may be immediate or remote in time, or they may be continuous in nature and form a chain of events, the nature of which and relation to the original injury it may be the duty of the medical expert to discover.

The present volume presents a most valuable discussion of these relationships in a manner which is readable, informative and accurate. Compensation attorneys, medical experts and compensation commissioners should find this an excellent addition to their libraries.

LEONARD GREENBURG

**A Practical Medical Dictionary**—By *Thomas Lathrop Stedman, M.D.* (11th rev. ed.) Ill. New York: Wood, 1930. 1222 pp. Price, \$7.50.

There is little to say about a dictionary which has gone through 11 editions, all of which have been favorably received. Dr. Stedman's work has made its place on merit. The latest edition has maintained the high standard of those preceding it. One must concede to the author of a dictionary the right of judgment as to the inclusion of certain words. Practically all dictionaries, for the sake of completeness, include many words which are useless to the vast majority of readers. There are some omissions from this volume

which we consider unfortunate, though they do not seriously affect its general value. The omitted definitions might well have taken the place of some which are given.

The volume ends with appendices giving a list of drugs, their doses and uses, weights and measures, temperature and barometric scales, chemical elements, pathogenic organisms and pathogenic microparasites. The printing is excellent, the type clear, and the illustrations good. The book can be entirely recommended.

M. P. RAVENEL

**Tobacco**—By *Walter L. Mendenhall, M.D.* Cambridge: Harvard University Press, 1930. 69 pp. Price, \$1.00.

This is one of the Harvard Health Talks, No. 17, delivered as a popular Sunday afternoon lecture. It gives many facts concerning tobacco and the effects of its use, useful tables of the amount of nicotine contained in many brands of cigarettes, and analyses of the composition of cigarette smoke.

It begins in a tone of levity which does not impress a serious reader favorably. It ends by leaving the matter entirely to the judgment of the individual. Certain important studies are not mentioned. On the whole, it is a fair statement of facts as far as known, but contains some senseless quotations from extremists on both sides which have no scientific value.

M. P. RAVENEL

**Science in the Kitchen. The Selection, Care and Service of Foods**—*Pittsburgh: Mellon Institute, 1930.* 82 pp. Price, \$.60.

This booklet contains much helpful information written in language which housekeepers generally can understand. In the section "Intelligent Purchasing of Foods" the biological value of proteins is referred to without explanation

as to its meaning, but perhaps this will stimulate study. The author's method of discussing the calorie is especially good. A possible criticism in the section "Good Meals for the Young Home Maker" is that too many unusual and expensive foods are recommended. On the whole it is one of the best popular discussions of foods which the writer has seen.

E. V. McCOLLUM

#### Introduction to Mental Hygiene—

*By Ernest R. Groves and Phyllis Blanchard. New York: Henry Holt, 1930. 467 pp. Price, \$4.00.*

Not being a specialist in mental hygiene, the writer has undertaken to review this book with some hesitation, in spite of an interest in the subject which has grown from year to year. A critical review will not be attempted. The great difficulty with most books, from the standpoint of the nonspecialist, is that they are hard to understand, and while the writer is not competent to criticise them further, he feels that they have not been of much value to many who would like to know something of the subject, even though they have no idea of specializing in it. He has for a long time been convinced that the average doctor should know more about mental hygiene, and therefore welcomes a book of this type.

The authors of this book have had experience in practical work as well as in teaching, and it is apparent that they can write understandingly for the educated layman. Such problems as those of childhood, adolescence, marriage, religion, school and college, recreation, etc., are necessarily of interest to everyone in this complex world.

Each chapter ends with suggestions for classroom discussion and written reports, and some illustrative cases are given. There can be little doubt that the average university faculty, medical as well as lay, knows little about mental hygiene, and often cares less, due

to the fact, probably, that it is a new science, and even among physicians is regarded as an abstruse specialty for the few. The authors discuss some methods by which faculties may be interested, and one cannot read this book without becoming convinced that knowledge of the subject which it discusses should be widely disseminated.

Of the many problems which arise in the lives of all, there is scarcely one that is not discussed sanely and helpfully. The great value of the book from the standpoint of the reviewer, apart from its soundness, is that it is understandable, and one does not have to be versed in the language of the alienist to profit by it. The reviews of the book by specialists have been favorable from the professional standpoint. In view of these and his own experience with it, it is recommended to the average reader with confidence. The printing and make-up are excellent.

M. P. RAVENEL

#### Tuberculosis Among Children—By

*J. Arthur Myers. Springfield, Ill.: Charles C. Thomas, 1930. 208 pp. Price, \$3.50.*

During the current year an attempt is being made to emphasize the importance of and to spread the knowledge about childhood tuberculosis. It is, for this reason among others, important to call attention to Dr. Myers's book on tuberculosis in children. The book contains little that is new but summarizes well what is known. It is of interest to note that in the diagnosis of tuberculosis in infancy and in childhood two measures only are of much significance, the tuberculin skin test (preferably the intracutaneous) and the roentgenological examination. In prophylaxis the importance of infection from tuberculous infants, children, and adults is stressed but no opinion is ventured upon the advisability of the use of BCG.

In the treatment of tuberculosis at these ages life in the open is less helpful, he thinks, than in a well ventilated room with the temperature and moisture controlled. Dr. Myers attributes to McPhedran the discovery that some of the hilar shadows are not glands but blood vessels seen end-on, while the reviewer has always been under the impression that John Weber of California first called attention to it. It is of interest to note that these little patients can be given too much fresh air. The possibility of a filterable form of the tubercle bacillus and the great value of diet in the treatment of lupus are not mentioned.

The author mentions combining X-ray and heliotherapy in the treatment of cervical adenitis but fails to warn of the danger of an X-ray burn when both are applied over the same area. It is jarring to see the word hemorrhage used as a verb. In another edition it is to be hoped that the quantity of tuberculin will be given in cubic centimeters and not in milligrams.

The book is excellent, typographically pleasing, and it is hoped and predicted that it will have the large circulation that it deserves. LAWRASON BROWN

**Report on Methods of Analyzing Butter**—Geneva, N. Y.: *New York Agricultural Experiment Station*, 1930. Price, \$.25 each report.

The American Dairy Science Association through its Committees on Chemical and Bacteriological Methods of Analyzing Butter has recently issued a report describing these methods. This appeared in the *Journal of Dairy Science* for September, 1930, published by the association.

The report on the chemical methods of analyzing butter has been prepared under the general supervision of Dr. A. C. Dahlberg by a sub-committee consisting of Professor E. S. Guthrie, Chairman, Professor V. C. Manhart,

Professor D. H. Nelson and Professor H. B. Ellenberger. The chemical section of this report is largely taken up with a discussion of the two general methods of making a complete analysis of butter in creameries. These are the procedures recommended by the Association of Official Agricultural Chemists and the Kohman test. The former method is generally used by federal government and state chemists, but the latter test is simpler of operation and satisfies the practical creameryman better. The entire discussion of methods is from the standpoint of a complete analysis of butter in the laboratory rather than for a rapid churn test and has been drawn up for industrial laboratory men rather than for the official control laboratory.

The microbiological methods have been drawn up under the general supervision of Dr. R. S. Breed by a sub-committee consisting of Professor E. H. Parfitt, Chairman, Dr. E. G. Hood, Professor B. W. Hammer and Professor H. Macy. Like the report on chemical methods this report has been drawn up primarily for industrial laboratory workers, and it gives a series of suggested methods for determining the number and kind of microorganisms in butter rather than an official procedure. Naturally the greater part of the report has been taken up with a discussion of the determination of the number of yeasts and molds in butter. This section is followed by a discussion of methods of determining the total number of bacteria present, the number of protein digesting bacteria present, and microscopical methods of examining butter for microorganisms.

This is the second in a series of reports on methods in analyzing dairy products to be issued by the Dairy Science Association, the ice cream report having been issued in 1927. Reprints of either report are available.

R. S. BREED

**The Measurement and Control of Municipal Sanitation.** *Committee on Uniform Street Sanitation Records of the International Association of Street Sanitation Officials, Chicago: 923 East 60th Street.*

In an address before the Sanitary Division of the American Society of Civil Engineers last January the reviewer pointed to the unsatisfactory state of development of municipal cleansing service in the United States and showed the impossibility of getting from the large cities figures by which to judge the relative cost of this work. The annual per capita cost among 24 cities answering inquiries ranged from \$.65 to \$4.46, according to the official data. Obviously the reports did not always cover the same items. There was no standard method of reporting or measuring the work done and in many instances it was impossible to get a clear picture of it. This situation could and should be changed.

The International Association of Street Sanitation Officials, made up largely of persons engaged in street cleaning and the collection and disposition of municipal refuse in the United States and Canada, appointed in 1928 a committee to collaborate with the National Committee on Municipal Standards to prepare a report on standards of measurement for this kind of service. The International City Managers' Association also entered with money from the Julius Rosenwald Fund and the University of Chicago, a part of which could be devoted to the committee's work. The report here reviewed is the product of this joint movement, or perhaps more accurately of Donald C. Stone, Gustave A. Moe and Clarence E. Ridley, whose advocacy of modern scientific business methods in municipal administration has attracted much attention.

Despite its title, the report has nothing to do with the measurement and

control of sanitation, except as related to the collection and disposal of municipal waste, snow, and the cleaning of catch basins, and in the field which it does cover, no help is offered on the subject of standards of cleanness or efficiency. These omissions are fully realized by the authors, who say they must be "taken into consideration," but do not tell how this should or can be done. And so with snow removal, the difficulties connected with measuring this work are catalogued, but no measure is proposed. Here is an old question which has puzzled commissions of engineers.

Perhaps no question of municipal administration offers so many difficulties to those who would introduce scientific methods of measurement and cost accounting as street cleaning, refuse collection and disposition, and snow removal.

Of the 3 parts into which the report is divided, (1) the need of measurement standards in municipal sanitation, (2) measurements applied to sanitation activities, and (3) records and cost accounting procedure, the first is the longest. The report is a vigorous argument for the adoption of uniform and suitable methods of measuring and recording the work done in cleaning street pavements and collecting, transporting and disposing of the solid refuse of the streets and houses, and for sound records which mean something. As the authors point out, "Accurate records of work performed and its cost are vital to good budgeting."

The unit proposed for street cleaning is the "curb mile" or the "cleaning of half of the street parallel to each curb line, including intersections, for a distance of one mile." By this is meant the combined lengths of both curbs. This unit does not show how many square yards are cleaned nor how many times the whole surface is gone over. The width of the street is not

taken into consideration. The unit has no relation to the dirtiness, state of repair, or kind of pavement, the season, weather, state of the traffic, or any other of the many conditions which enter into the difficulty and cost of this kind of work, and make it so hard to measure satisfactorily.

The report favors the short ton as the unit of measurement of refuse, but when it cannot actually be weighed, recommends that the volume be estimated.

The document is put forward as a tentative draft, a "skeleton" of what the final report will be. The committee plans to design a guide for sanitation officials in preparing their annual departmental reports. The committee is under no illusions concerning the size and difficulty of the task. It has made a good beginning. Let us hope it will be strong enough to carry out the whole task in a businesslike and practical manner.

GEORGE A. SOPER

### Practical Applications of Heredity

—By Paul Popenoe. *Baltimore: Williams & Wilkins, 1930.* Price, \$1.00.

This little book is largely made up of essays which have already appeared in several more or less popular journals. The titles are all interesting. There are many anecdotes of well known geniuses as well as impostors, some of whom have assumed this rôle for profit and some from mental derangement.

The book is charmingly written and contains much practical advice.

M. P. RAVENEL

### A Study Guide Text-book in the Principles and Practice of Nursing

—By Lulu K. Wolf. *New York: Macmillan, 1930.* 139 pp. Price, \$.70.

This book should prove a valuable aid to the busy instructor who has found the work of making out adequate

sets of the new type questions both puzzling and time consuming. It is particularly good for the student to have the subject material covered by questions which are not in her instructor's own familiar phraseology.

Each set of tests seems especially well planned to impress the student with the necessity for definite clear cut facts rather than the vague impressions which sometimes pass for knowledge. The clever hints at several possibilities in many of the answers where only one may be used are stimulating to any reader (instructor included) to search for exactness in information.

A problem to be worked out by a study of suggested references is skillfully presented at the beginning of each lesson. References are clearly indicated.

There is a strong, splendid appeal in the paragraph which the author calls a "Foreword" following each problem. Instructors and executives who are aware of the difficulties met in placing serious responsibilities on youthful shoulders will find a frequent reading of these well-thought-out paragraphs both stimulating and inspiring.

There are numerous suggested graphs showing means of working out class relationship curves, etc., which some instructors are finding useful for creating a desire in their students for creditable rating.

HARRIET E. DAVIS

### Introduction to Human Parasitology

—By Asa C. Chandler, M.S., Ph.D. (4th ed.) *New York: Wiley, 1930.* 655 pp. Price, \$5.00.

This volume, rewritten and enlarged, supersedes the well known text, *Animal Parasites and Human Diseases*, by the same author.

A book which has been so long before the public and has been so favorably received by teachers as well as critics needs no comment further than to say that the new volume has been improved



in practically every way and brought up to date. It is an eminently practical book for the teacher as well as the practitioner.

The illustrations are good and abundant. The printing and binding are excellent. We know of no text on this general subject which can be as unhesitatingly recommended.

M. P. RAVENEL

**Is It Safe to Work? A Study of Industrial Accidents—By Edison L. Bowers.** *New York: Houghton Mifflin, 1930. 229 pp. Price, \$2.50.*

Why is it that we, who have such a hatred for war, condone a continual battlefield in industry, where the casualties exceed those of war? Reliable authorities agree that 75 per cent or more of all accidents could be avoided. In brief, the book gives clear and practical suggestions for the prevention of accidents and discusses compensation, and the re-training of injured workers, all three of which subjects are insisted upon as related parts of one comprehensive program. The work is by a professor of economics who is also the author of the book *Compulsory Automobile Insurance*.

Gross injustices in our present workmen's compensation system exist, and scientific treatment of the injury problem has been made impossible because of the conditions surrounding the passage and administration of accident, compensation, and vocational rehabilitation legislation. The potential relationships between these three still remain for the most part unappreciated.

Each of the 14 chapters ends with a

concise summary and conclusion, and the subject matter, which is commensurably rich in statistical evidences, takes up the workmen's compensation systems and schedules in the United States and foreign countries with special chapters devoted to the California and British Columbia Systems and another upon the American Rehabilitation System. The present death benefits are considered inadequate, which in itself causes serious problems, for which industry should be held responsible. The American safety movement and the fundamentals of accident prevention, with their relations to compensation laws and merit premium rating, comprise another chapter, while the two final chapters are devoted to "Outlines of a Permanent Partial Disability Schedule" and "Workman's Compensation or Limited Insurance?" Efforts to improve compensation must always have as their ultimate aim injury prevention. Safety is, after all, the real challenge to industry today. New methods and increased production demand that producers be held accountable for safety, and purchasers should pay the cost.

There is a set of notes for each chapter and an unusually replete bibliography classified under General Treatises, Accident Prevention, Workman's Compensation, and Rehabilitation.

The present work is a forcible presentation of the essentials, shortcomings, and possible solutions of the great "accident-compensation-rehabilitation" question. The material is fluently presented, the type is large and readable, and the subdivisions are logically captioned.

EMERY R. HAYHURST

# HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

**Measuring Municipal Sanitation**  
—The Committee on Uniform Street Sanitation Records of the International Association of Street Sanitation Officials has published under date of September, 1930, a tentative draft of a report on the measurement and control of municipal sanitation. City administrators will find much valuable material here.

The need of measurement standards in municipal sanitation, measurements applied to sanitation activities, and records and cost accounting procedures are the major topics treated. In the words of the committee, the purpose of this manual is

(a) To provide the sanitation administrator with the proper information to plan, supervise, and control the operations of his department, (b) to furnish him with a factual basis for preparing budget and appropriation estimates, (c) to supply him with a method of reporting his work to the public, and (d) to develop sufficient uniformity in reporting so that the administrator can compare his quantities, costs, and methods with those of other cities.

**Pittsburgh County, Okla.**—This very attractive annual report of 13 pages describes the work of the coöperative health unit in 1929 for this county of 1,370 square miles, with 50,778 population. There are 116 schools with an enrollment of 11,000. Disbursements amounted to \$10,000.

There were 136 lectures given with an attendance of 1,311 in addition to 97 group conferences. Photographs illustrate the work being done to improve sanitary conditions. About half of the population have been inoculated with typhoid vaccine. There were 29 cases of typhoid and 24 cases of tuberculosis reported last year. The health department has 23 tuberculosis cases under supervision while 13 are in institutions. Prenatal conferences numbered 43, with

an attendance of 150, while 114 home nursing visits were made to these cases. There were 354 babies examined in conferences and 133 home nursing visits made in behalf of these children. School work included 2,277 physical examinations.

**Wood County, W. Va.**—This is an interesting and well printed report of a county health department operating on a budget of 24 cents per capita. The milk supply is over 50 per cent pasteurized and is supervised by frequent inspections (350 dairy farms) and laboratory examinations. Nearly half of the 285 laboratory tests showed bacteria counts under 50,000 during the year. There are 20 retail dairy farms and 2 pasteurizing plants.

During the year 523 physical defects were corrected among school children, 700 persons were inoculated with typhoid vaccine, 600 were vaccinated, and 4,200 complete diphtheria toxin-antitoxin administrations were given.

**Quincy, Mass.**—The 1929 report is modelled, as heretofore, on the *Appraisal Form for City Health Work* of the American Public Health Association. A rating of 742 points compares with 712 in 1928. An organization chart prepares the reader for a clear understanding of the report of community health services.

There were 18 cases of diphtheria reported during the year with 2 deaths. As in previous years, prevention clinics were held weekly in various wards, and 3,700 children, half of whom were of school age, were immunized. In the child hygiene clinics there was a registration of 3,259, with an attendance of 7,154, besides 3,817 home visits by nurses in behalf of these children.

There were 397 visits made by children to the habit clinic with 737 visits to homes by the social worker.

**Newton, Mass.**—Careful preparation and good printing in readable type on dull coated paper characterize this health department report of 15 pages. A death rate of 9.8, based on a population of 58,758, with a birth rate of 14.9 and an infant mortality rate of 47.8 are statistical records worthy of note. Per capita expenditures amounted to 71 cents.

There were only 7 cases of diphtheria with 1 death. During the past 5 years there have been but 2 deaths from this disease. In each instance, the patient was not brought under treatment until the 3d or 4th day after onset. There were 367 kindergarten children immunized during the year. Approximately 96 per cent of the milk supply of the city is pasteurized.

**Hartford, Conn.**—On the basis of an estimated population of 176,318, a resident death rate of 10.4 and a birth rate of 17.5 are recorded in the 1929 report of the Board of Health. This city also reports an infant mortality rate of 71.1.

A detailed financial statement, classified by functions, shows total expenditures of \$182,172, of which \$82,520 were for the isolation hospital. Receipts amounted to \$21,299, of which \$16,251 were derived from the hospital. In common with the rest of New England, Hartford experienced a severe epidemic of respiratory disease and influenza in January. There were no deaths from typhoid or scarlet fever during the year. Diphtheria, measles, and whooping cough each yielded a death rate of 2 per 100,000. The death rate for tuberculosis was 77.1, compared with 71.9 in 1928, the 1929 rate among whites being 64.5 and among the colored, 400.

A juvenile tuberculosis clinic has been maintained at the Hartford Dispensary, at which 233 children received Mantoux tests and 174 physical examinations were made. The appraisal score for 1929 was 955 points out of a possible 1,400.

**Springfield, Mass.**—The birth rate for the year 1929 was 21.5 per 1,000 population, an increase of 1.5 over 1928. The crude death rate was 12.3 per 1,000; the infant mortality rate 54.5 per 1,000 births. The following specific death rates (per 100,000 population) were shown: tuberculosis 52, typhoid fever 0.6, diphtheria 1.5, measles 4.5, whooping cough 1.3, scarlet fever 0.6, heart disease 243, cancer 137.

Medical supervision is given to all the public and parochial schools in the city, except the high schools. The entire school system is provided with nurses, 64,620 school inspections having been made in 1929. Thirty-eight nutrition classes have been formed for children who are at least 8 lb. underweight for height and age. Six dental dispensaries are provided, so that all the school children in the three lower grades are receiving the necessary care and treatment of teeth. Children in the nutrition classes receive the necessary attention regardless of grades.

The per capita appropriation for health in Springfield is \$1.38, as shown in the 1929 annual report. The department hospital receives 63 cents; 33 cents is used for medical inspection of school children.

**Los Angeles County**—A supplemental annual report of the Board of Supervisors deals with Public Health and Welfare Activities for the year ending June 30, 1929. Administrators will be particularly interested in the photographs and architect's plans of health centers which form an important part of the county health and welfare program.

It is our belief that the efficiency developed by grouping the health department, county welfare, school and other workers in the districts together under one roof has proven to be one of the greatest advances in service to the people performed by the County Government within recent years. We are happy to state that the Grand Jury report of 1928 and the survey conducted by the Bureau of Efficiency, assisted by the American Public Health Association, not only revealed no serious weakness in the department but strongly supported our policies and management.

Functional organization charts include personnel and salaries for each bureau and division of the health department. Extensive statistical tables accompany enlightening descriptive text. In the division of accounts is a business manager. A comprehensive report system is maintained showing the work performed in and costs to the 35 cities with whom contracts are made by the county department. Annual summary sheets are compiled showing the units of service and the costs for the various health districts. The Hollernith Division tabulates 63,000 cards monthly. There are 10 buildings owned by the County with approximately 65,000 square feet of floor space, besides 12 buildings rented with approximately 11,000 square feet, 28 other buildings in which the department is given the free use of 81 rooms, besides 33 rooms occupied in municipally owned buildings.

Functional studies of the city and county health expenditures of public and private agencies are tabulated to show a combined per capita total of \$2.98, \$1.60 by city agencies and \$1.38 by county agencies. The county health department budget for the fiscal year was \$1,092,691, of which \$696,733 was for salaries, \$200,530 for current expenses, \$64,313 for outlay, and \$131,115 for structural expenses.

Medical social service forms an important part of the work and many thousand contacts were made and inter-

views were held with health center cases during the year. Among other services, 2,150 cases were admitted for medical care, while 692 others were referred to physicians and dentists as not being eligible for treatment at the centers according to existing "Standards of Eligibility."

The personnel of the bureau of maternal and child hygiene consists of 39 full-time and 6 part-time trained physicians, dentists and assistants, exclusive of public health nursing supplied by a special bureau. There were 487 prenatal cases who made 2,571 clinic visits, while 52,044 infant and preschool visits were made to medical conferences. The services of this bureau may serve as an illustration of the activities of the health department described in the comprehensive report.

**Connecticut**—The 10th report of the Connecticut Public Health Council for the year ending June 30, 1929, occupies 476 pages of descriptive text, tables, charts and maps, and includes a full account of the successful New England Health Institute of 1928, when 1,200 were registered, and the Fiftieth Anniversary celebration of the Department. A classified statement of disbursements for the fiscal period July, 1928–June 30, 1929, shows total expenditures of \$281,881.

The second lowest annual death rate of 11.1 is recorded for 1928, the rate for the previous year being 10.6. Typhoid fever (0.6), scarlet fever (1.4), diphtheria (5.3), and diarrhea and enteritis reached record low death rates. An average infant mortality rate of 65.6 for 4 years 1925–1928 contrasts with a rate of 142.8 for the 5 years 1900–1904. The major new activity was the survey of hospitals and their licensing as provided by a law passed in 1927. Fifteen hospitals were licensed for general use and 41 for chronic and convalescent care. The Division of Occupational Diseases has extended its services and

reporting of cases has increased considerably.

A tabular review of the Public Health Instruction Service indicates that during the year there were 280 film showings, 162 public addresses, 4,819 slides used, 35 strip film and 77 lantern showings, 811 posters displayed and 21 exhibits prepared.

The revised directory of nurses shows 3,552 on the list, 355 being engaged in general public health work in the State, 142 in school nursing, 119 in industrial nursing, 788 in institutions, and 1,718 in private duty nursing, among others. Of the 3,552, 713 are inactive or residing out of the State. Field supervision and advice is given by the Bureau of Public Health Nursing.

Well child conferences under state auspices number 58. At these conferences 3 kinds of services are rendered: (1) for very young children, a physical examination and advice to mothers; (2) for children about to enter school, a physical examination and particular advice about correction of defects before school begins; (3) for the 4 to 6 year-old children, the cleaning of the teeth and instruction and demonstration of their care. In certain localities, the dentists give their services, and at each child conference local physicians give their services in examining children. Reports of the various other bureaus and divisions, including laboratories, sanitary engineering, and mental hygiene, indicate an impressive volume of work which is interestingly described by the use of maps, tables and charts accompanying descriptive text.

**White Plains, N. Y.**—In the Health Conservation Contest of the U. S. Chamber of Commerce in 1929, White Plains was awarded first place among cities of 20,000 to 50,000 population. This 5th published annual report of the department reflects credit to the city and the staff for the health program

which has been developed. In the words of the health officer, "as the years have passed, the ideals of preventive medicine have gradually become an accepted part of our community life." It is noteworthy that the Mayor "has attended all meetings of the Board and his advice has been graciously extended on many occasions."

On the basis of a population of 32,250, a death rate of 9.9, a birth rate of 21.9 and an infant mortality rate of 40 are recorded. The health of 403 infants, 337 preschool children and 166 expectant mothers was supervised in the health department clinics, while 6,479 school children were under the medical supervision of the Department of Education. Fifteen clinics were held in the spring and fall for the immunization of children against diphtheria (417) and vaccination against smallpox (157).

The budget of the health department amounted to \$1.23 per capita. In addition, expenditures of the board of education for the health work amounted to 64 cents per capita, and those of the Nursing Association to 77 cents per capita. The Department of Charities expended \$2.91 per capita for hospitalization and care of communicable disease, tuberculosis, maternity, psychopathic, and other types of cases. On the *Appraisal Form for City Health Work* the public health work of the city scored 812 out of a possible 1,000 points. The report of 71 pages is well illustrated with photographs and charts.

**East Orange, N. J.**—The new health building is effectively pictured on the cover of the 15th annual report of East Orange for 1929. This new health center was erected by the city as one of the units in its new Civic Center. A reproduction of the award of the U. S. Chamber of Commerce for the best accomplishments in health conservation in cities of 50,000 to 100,000

in 1929 features the first page. This is followed by an appraisal chart of health practices which shows a rating of 880 out of a possible 1,000 points, which compares with a score of 848 in 1928.

"The year gives us the smallest number of scarlet fever cases on record, there being only 73 cases reported. A reduction in the cases of diphtheria from 46 the year previous to 33 for this year, in spite of a high prevalence in neighboring communities, speaks for itself, emphasizing the importance of diphtheria immunization." Preschool immunizations against diphtheria increased from 569 to 706, two-thirds of the increase being accounted for by physicians in private practice.

This city, with a population of 70,888, records a birth rate of 12.7, 80 per cent of the births occurring in hospitals. Population, birth and death rates are analyzed by wards. A death rate of 9.5 is reported. Of special interest to administrators is a report of a prevalence study of venereal diseases which showed a rate of cases under treatment on a given day of 3.8 per 1,000 population, 2.3 for syphilis and 1.5 for gonorrhea. Adjustments based upon the annual turnover of these diseases raises the an-

nual incidence to 8.9, 2.3 for syphilis and 6.6 for gonorrhea.

A tuberculosis death rate of 35 is recorded, as compared with 84 for the years 1915-1919. The tuberculosis control work of the city is carried on by the Anti-tuberculosis League of the Oranges and Maplewood. There were 68 cases reported in 1929, and 229 cases in the active file at the close of 1928. A special study of deaths among females for the years 1920-1929 fails to show the increase at ages 15-25 noted for the country as a whole. Of cases in sanatoriums, 32.4 per cent were in the incipient stage. The total patient days of 71 cases amounted to 13,056, with an average length of stay of 189 days.

An increase in laboratory analyses is noted since the health department moved into new quarters. During the year, 5,614 examinations were made in the city and other local laboratories. This comprehensive report, which is one of the best of the year, concludes with 7 recommendations by the health officer, a report of the finance committee showing an expenditure of \$47,514, and a list of members of the board of health and the staff of the health department.

## BOOKS RECEIVED

- BACTERIOLOGICAL TECHNIQUE. 3d ed. By J. W. H. Eyre. New York: Wood, 1930. 619 pp. Price, \$7.50.
- PHYSIQUE AND INTELLECT. By Donald G. Paterson. New York: Century, 1930. 304 pp. Price, \$2.50.
- THROUGH EARLY CHILDHOOD. By Arthur Whitefield Spalding and Belle Wood-Comstock. Mountain View, Cal. Pacific Press, 1930. 348 pp. Price, \$2.00.
- LEGAL ANATOMY AND SURGERY. By Bernard S. Maloy. Chicago: Callaghan & Co., 1930. 804 pp. Price, \$15.00.
- SOCIAL WORK YEAR BOOK. Fred S. Hall, Editor. New York: Russell Sage Foundation, 1930. 600 pp. Price, \$4.00.

- NUTRITION AND DIET THERAPY. A Textbook of Dietetics. 5th ed. By Fairfax T. Proudft. New York: Macmillan, 1930. 705 pp. Price, \$2.75.
- PRINCIPLES OF WOMEN'S ATHLETICS. By Florence A. Somers. New York: Barnes, 1930. 151 pp. Price, \$1.60.
- CITY NOISE. Report of the Commission Appointed by Dr. Shirley W. Wynne, Commissioner of Health, to Study Noise in New York City and to Develop Means of Abating It. New York: Noise Abatement Commission, 1930. 308 pp.
- FIGHTING TOBACCO THE SUCCESSFUL WAY. By J. Raleigh Frost. St. Louis: Frost & Dec-tiar, 1930. 24 pp. Price, \$2.25.

# A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

**Mental Deficiency**—Better obstetrical and pediatric service will prevent a very common cause of mental deficiency, that is produced by birth injuries and infant diseases. Health qualifications for marriage and eugenic sterilization are also discussed by the authors.

BARR, M. W., and WHITNEY, E. A. Preventive Medicine and Mental Deficiency. *New Eng. J. Med.*, 203, 18: 872 (Oct. 30), 1930.

**Panama Canal Zone Health Administration**—Not only the well known anti-mosquito work, but the many other successful projects of the Panama Canal Health Department are interestingly recounted.

CHAMBERLAIN, W. P. The Health Department of the Panama Canal. *New Eng. J. Med.*, 203, 14: 669 (Oct. 2), 1930.

**Poliomyelitis Virus Studies**—Concentrated poliomyelitis virus remains potent more than 4 months. Streptococci were no longer viable after 35 days. This finding tends to discredit the streptococcus as a specific agent of the disease. Attempts to cultivate any organism were negative.

CLARK, P. F., *et al.* Some Properties of Poliomyelitis Virus. *J. Bact.*, 20, 3: 213 (Sept.), 1930.

**Influenza-Pneumonia Mortality**—A 20-year study of the deaths from influenza and pneumonia is presented in the form of graphs for each of 50 cities.

COLLINS, S. D., *et al.* Mortality from Influenza and Pneumonia in 50 Large Cities of the United States, 1910-1929. *Pub. Health Rep.*, 45, 39: 2277 (Sept. 26), 1930.

**Typhoid Vaccine After Infection**—Persons who received prophylactic injections of typhoid vaccine after infec-

tion but before symptoms commenced had an attack of much shorter duration and milder symptoms than those who received no vaccine.

CROUCH, J. H. A Study of the Effect of Typhoid Vaccine When Given After Infection. *Pub. Health Rep.*, 45, 41: 2429 (Oct. 10), 1930.

**Training of Health Workers in Great Britain**—This interesting symposium on the training of medical officers of health, practicing physicians, health nurses and sanitary inspectors will prove of value to American educators who are training the sanitarians of the future.

FITZGERALD, J. G., *et al.* General Outline of the Problem of Training Health Workers. *Brit. M. J.*, 3641: 631 (Oct. 18), 1930.

**Health Education vs. Health Ignorance**—As forceful as it is modest is this answer to the recent utterances of a visiting British medical celebrity and the president of our own medical association, to wit, that in the realms of health, ignorance is truly blissful.

FRANKEL, L. K. The Future of Medical Practice. *New Eng. J. Med.*, 203, 15: 713 (Oct. 9), 1930.

**Breast vs. Bottle Feeding**—Poor economic and hygienic conditions, rather than breast or bottle feeding, are responsible for frequency of infection and instance of infant mortality. In districts where economic and hygienic conditions are good, the average bottle-fed infant does as well as the average breast-fed baby. Uncomfortable findings for the breast feeding propagandist.

GLAZIER, M. M. Comparing the Breast-Fed and the Bottle-Fed Infant. *New Eng. J. Med.*, 203, 13: 626 (Sept. 25), 1930.

**Undulant Fever**—Young adults, especially men on farms or in packing houses, are most frequently the victims of undulant fever, a widespread disease caused as often by contact with infected animals, or their tissues, as by drinking unpasteurized milk from diseased cows. An authoritative and exhaustive study.

HARDY, A. V., *et al.* Undulant Fever. Pub. Health Rep., 45, 41: 2433 (Oct. 10), 1930.

**Rural Health Administration**—The annual progress report of the rural health work in which the U. S. Public Health Service coöperates evidences again the irresistible trend of this most important activity.

LUMSDEN, L. L. Coöperative Rural Health Work of the Public Health Service in the Fiscal Year 1930. Pub. Health Rep., 45, 43: 2613 (Oct. 24), 1930.

**Industrial Nursing**—Excellent advice for the industrial nurse presented effectively.

MCCONNELL, W. J. Practical Suggestions for Nurses in Industry. Pub. Health Nurse, 22, 10: 509 (Oct.), 1930.

**Training Health Officers**—Describing the coöperative project of the Tennessee State Department of Health and Vanderbilt University in which health officer candidates undergo classroom and field training.

MOUNTIN, J. W. The Training of Health Officers. Pub. Health Rep., 45, 40: 2378 (Oct. 3), 1930.

**Early Detection of Tuberculosis**—A plea for a program of early detection of tuberculosis in children, so that by suitable treatment clinical disease in adults may be prevented.

ORIE, E. L. The Significance of Advanced Tuberculous Infection of School Children. J. A. M. A., 95, 16: 1151 (Oct. 18), 1930.

**Prophylactic Vaccination Against Colds**—Catarrhal vaccine seems to be helpful as a prophylactic in half the persons who take it.

MURRAY, H. G. Prevention of Colds by Vaccine Therapy. New Eng. J. Med., 203, 15: 727 (Oct. 9), 1930.

**Dairy Farm Inspection**—An interesting account of the District of Columbia dairy inspection service well fortified with convincing photographs.

SANDS, E. R. Inspection of Dairy Farms. Munic. San., 1, 10: 557 (Oct.), 1930.

**Home Care of Cardiacs**—Types of cardiac cases among children are classified and the nursing care of each class is considered.

SUTTON, L. P. Follow-up Care of Cardiac Children in the Home. Pub. Health Nurse, 22, 10: 503 (Oct.), 1930.

**Vitamins in Cereal**—A new breakfast cereal rich in vitamins and minerals is suggested. It is composed of wheat, oat and corn meal, wheat germ, bone meal, brewer's yeast and alfalfa. It is palatable.

TISDALL, F. F., *et al.* A New Cereal Mixture Containing Vitamins and Mineral Elements. Am. J. Dis. Child., 40, 4: 791 (Oct.), 1930.

**School Child Health Administration**—An inclusive discussion of sanitary, medical, and hygienic (personal) aspects of school health.

WILSON, C. C. School Health Education. J. Health & Phys. Ed., 1, 8: 12 (Oct.), 1930.

**Water Treatment**—A progress report covering modern methods of filtration, chlorination, taste and odor removal and laboratory control.

WOLMAN, A., *et al.* Recent Progress in the Art of Water Treatment. J. Am. Water Works A., 22, 9: 1161 (Sept.), 1930.



## NEWS FROM THE FIELD

### NATIONAL COMMITTEE FOR MENTAL HYGIENE OFFERS FELLOWSHIPS

TO assist in lessening some of the shortage of properly trained psychiatrists The National Committee for Mental Hygiene offers fellowships toward the acquisition of the special preparation required. Details of these fellowships can be had from Dr. Frankwood E. Williams, Medical Director, National Committee for Mental Hygiene, 370 Seventh Avenue, New York, N. Y.

### INTERNATIONAL ASSOCIATION OF MILK DEALERS CONVENTION

THE International Association of Milk Dealers held its twenty-third annual convention at the Hotel Statler, Cleveland, O., October 20, 21 and 22.

The election of officers at the close of the convention returned Dr. F. D. Walmsley to the presidency of the association for another year. L. A. Van Bomel, president of Sheffield Farms Co., New York, N. Y., was reelected vice-president; Dr. D. B. Peck of the Bowman Dairy Co., Chicago, Ill., was named treasurer again; and R. E. Little, of Chicago, was reelected executive secretary.

### NEW YORK SOCIETY FOR THE EXPERIMENTAL STUDY OF EDUCATION

THE Health Education Section of the New York Society for the Experimental Study of Education held its second dinner meeting at the Men's Faculty Club of Columbia University, New York, N. Y., November 14, 1930.

Dr. Percival M. Symonds, Chairman of the Mental Hygiene Committee of the White House Conference, addressed the group on needed research in Health Education.

### INTERNATIONAL ASSOCIATION FOR THE PREVENTION OF BLINDNESS

THE International Association for the Prevention of Blindness held its annual meeting on Friday, October 10, at the Palais des Academies, Brussels, Belgium. Numerous ophthalmologists attended this meeting, and interesting national reports were made, dealing with the prevention of those diseases and accidents which lead to destruction or impairment of sight.

### MISSOURI WATER AND SEWAGE CONFERENCE

THE Sixth Annual Meeting of the Missouri Water and Sewerage Conference was held in Columbia, Mo., October 23-24-25, 1930. The following officers were elected for the coming year: Chairman, J. N. Wells, Joplin; Vice-Chairman, E. E. Wolfe, Hannibal; and Secretary-Treasurer, H. D. Peters, Jefferson City. Executive Committee: R. L. Barker, Odessa; O. L. Hebbler, Higginsville; Hugh Brown, Vandalia, and W. J. Gray, Springfield.

### AMERICAN JOURNAL OF CLINICAL PATHOLOGY

DR. T. B. Magath of the Mayo Clinic has accepted appointment as editor-in-chief of the new official journal of the American Society of Clinical Pathologists, the *American Journal of Clinical Pathology*, of which the first number will be issued in January 1931.

The new journal will emphasize new methods in laboratory work, the material being primarily of a practical and clinical nature. It is designed to be useful and serviceable to the technician as well as to the pathologist. For the present the journal will be published bimonthly.

## DELTA OMEGA NEW OFFICERS

**J**OHAN A. Ferrell, M.D., of the Rockefeller Foundation, New York, N. Y., was elected president of Delta Omega, the honorary public health society, at the annual meeting held in Fort Worth, Tex., October 29, 1930. Dr. Ferrell succeeds C. C. Young, D.P.H., of Lansing, Mich. Other officers elected were James A. Tobey, Dr.P.H., New York, as vice-president; and Professor Ira V. Hiscock of the Yale School of Medicine as secretary-treasurer. George W. McCoy, M.D., Director of the National Institute of Health, Washington, D. C., was elected an honorary member of the society.

Delta Omega now has 316 members, distributed in 6 chapters at the Johns Hopkins School of Hygiene and Public Health, Harvard School of Public Health, Massachusetts Institute of Technology, University of Michigan, Yale School of Medicine, and University of California. The honorary members of the society include President Hoover, Surgeon General H. S. Cumming, Charles V. Chapin, M.D., F. F. Russell, M.D., Sir Arthur Newsholme, W. S. Rankin, M.D., and S. Josephine Baker, M.D.

The society has made arrangements with the American Public Health Association for the reprinting of Dr. William Budd's classic work on typhoid fever, which first appeared in 1873.

## NEGRO PUBLIC HEALTH NURSING

**T**HAT the most urgent needs of the Negro public health nursing group are better fundamental training for the Negro nurse herself and a willingness on the part of whites to accord professional standing to her, are the chief findings of a preliminary survey of public health nursing by and for Negroes conducted under the auspices of the Julius Rosenwald Fund. Data for the survey were gathered by Marjorie Stim-

son, assistant director, and Louise Tattershall, statistician, of the National Organization for Public Health Nursing. A compilation by Stanley Rayfield is published in the current issue of *The Public Health Nurse*.

## SWEDEN TO GET NEW DENTAL CLINIC

**T**HE City of Stockholm, Sweden, has been offered \$1,000,000 by George Eastman for the construction and equipping of a dental dispensary similar to the Rochester Dental Dispensary, according to announcement made by Dr. Harvey J. Burkhart, director of the Rochester Dental Dispensary.

GOVERNMENT HOSPITALS IN NEED OF  
MEDICAL OFFICERS, NURSES, AND  
SOCIAL WORKERS

**A** GOVERNMENT release states that government hospitals throughout the country, including those under the Veterans' Bureau, the Public Health Service, the Indian Service, and other branches, are in need of medical officers and nurses of various grades, and that Veterans' Bureau hospitals have vacancies in positions of psychiatric social worker and junior social worker.

## CHILD LABOR DAY

**C**HILD Labor Day, the last Sunday in January, presents the opportunity for the people of any state to give thought once again to the conditions of child employment in their own community.

Any one interested in knowing more about child labor conditions can secure information from the National Child Labor Committee, 215 Fourth Avenue, New York, N. Y.

This Committee will send free of charge, to any interested reader, information with regard to child labor in any state together with literature, posters, plays and photographs.

## A. N. A. BIRTHDAY

NEXT autumn, the American Nurses' Association will pass its thirty-fifth birthday anniversary. It is making extensive plans now for the observance of this milestone. A membership drive is planned, to commence in early January and to be concluded on the anniversary day, September 2, 1931. The January issue of the *American Journal of Nursing* will carry full plans for this campaign and there will be also a feature story telling of the growth of the A. N. A. from a little group of a score of women to a national organization with 86,000 members.

INTERNATIONAL ASSOCIATION OF DAIRY  
AND MILK INSPECTORS

THE 19th annual convention of the International Association of Dairy and Milk Inspectors was held in Cleveland, O., October 23, 24 and 25.

Officers elected for the ensuing year were: President, Dr. A. R. B. Richmond, Toronto, Ont.; First Vice-President, William B. Palmer, Orange, N. J.; Second Vice-President, Dr. Horatio N. Parker, Jacksonville, Fla.; Third Vice-President, Paul F. Krueger, Chicago, Ill.; Secretary-Treasurer, Dr. Paul B. Brooks, Albany, N. Y.

PREVENTION OF BLINDNESS  
CONFERENCE

THE 1930 annual conference of the National Society for the Prevention of Blindness was held at the Russell Sage Foundation Building, New York, N. Y., November 17-18. Special sessions included such topics as conservation of vision in school children, the relation of lighting to vision conservation, sight-saving class activi-

ties in America and medical social service in conservation of vision. A feature of this year's conference was the showing of a new two reel motion picture depicting some of the principal causes of blindness and explaining how they may be prevented. Announcement was made of the publication of the new *Sight-Saving Review*, Volume I, Number 1 of which will appear early in 1931.

## A NEW METHOD OF MILK PRODUCTION

A NEW system of milk production, eliminating the human factor, was inaugurated at the Walker-Gordon Farm at Plainsboro, N. J., on November 13, 1930, when Thomas A. Edison pressed a button putting in operation a device known as a "rotolactor." This machine comprises a revolving platform with stanchions for 50 cows. As each cow takes her place on the platform, she is washed, dried, a little foremilk is taken for inspection, and then she is milked by machine. At the end of the revolution of the platform, which requires 12½ minutes, one cow steps off, and her place is taken by another. The milk is automatically transferred to a weighing machine, then conveyed through sterile pipes to the filling room, where it is bottled and capped by machine. The milking machines are rinsed and sterilized after each milking.

At the dedication of this new system, Governor Morgan Larson of New Jersey presided, and addresses were made by Secretary of Agriculture Arthur M. Hyde, Dr. Theobald Smith, Dr. Samuel J. Crumbine, and Henry W. Jeffers, president of Walker-Gordon Laboratories, who originated the 'rotolactor. About 4,000 persons, including many health officials and physicians, attended the ceremonies.

#### RECENT CHILD-WELFARE MEASURES IN ITALY

THE appropriation for the National Children's Bureau of Italy for the fiscal year, 1930-1931, has been raised to 65 million lire (\$3,399,500), an increase of 35 million over the preceding year. The bureau is engaged in various phases of theoretical and practical child welfare work and maintains many child welfare institutions.—*La Medicina del Lavoro*, N. 2, 1930, p. 75.

#### NEW PSYCHIATRIC INSTITUTE

THE new Psychiatric Institute of the Grasslands Hospital at Valhalla, N. Y., will open in the near future. The building has a capacity of 82 beds and is modernly equipped.

#### TUMOR CLINIC

THE Jewish Hospital of Philadelphia will establish a research tumor clinic under the direction of Dr. Leon Solis-Cohen. The clinic will have for its object, not only the treatment of patients according to the best methods of the day, whether medical, radiological, electrical, surgical, or ether, but also and especially the study of the means of early recognition of the affection.

Dr. Joseph C. Doane, Medical Director of the hospital, will act as consulting physician, and on the advisory board. In addition, the members of the visiting staff of the Jewish Hospital will give their services as consultants in medicine, surgery, and the various specialties.

#### TRAINING OF FACTORY WELFARE WORKERS IN ITALY

A COURSE for the training of women to do welfare work in factories will be started on January 15, 1931, at the School of Social Work in Rome. The curriculum will include certain phases of law, economics, medicine, and hygiene, and methods of social service. The course will last one year.

—*Le Assicurazioni Sociali*, Rome, 4: 186, 1930.

#### CHILD WELFARE WORK IN THE CITY OF GRAZ, AUSTRIA

THE organization of public child welfare work in the city of Graz is considered as one of the best outside of the capital. The central public authority for child welfare work is the municipal children's bureau, which has 21 branches throughout the city. The bureau has charge of all phases of child welfare work except education. Perhaps the most important part of this work is the guardianship of illegitimate children and legal aid to their mothers, particularly when it is necessary to obtain support from the child's father. Another branch of the bureau's work is the administration of poor relief in the cases of children and young persons under 18 years of age, including the serving of dinners.

At the health centers for expectant mothers maintained by the bureau, the women receive, in addition to medical advice, also gifts of money and clothing.

The bureau is also exercising supervision over wayward children through a staff of trained visitors, and it maintains institutions for such children; it is carrying out the probation work for the juvenile court and is in other ways co-operating with the court.

The municipal centers for children and young persons are also under the direction of the children's bureau; this includes the dental and orthopedic clinics, and clinics for the diseases of the ear, nose, and throat.

The bureau also maintains sanatoriums for tuberculous children and vacation homes for undernourished children, also a health center for expectant mothers, and coöperates with the six infant health centers existing in the city of Graz.—*Ztsch. f. Kinderschutz, Familien- und Berufsfürsorge*, Vienna, 8-9: 118, 1930.

# INDEX

	Page
Abell, R. W. The DDE—A New Research Microscope for the Scientist.....	654
Accepted Foods. Editorial.....	640
Acidophilus Milk from Milk Treated by Electricity, Preparation of. E. D. Devereux.....	1009
Administration of Swimming Pool Standards in Detroit. William H. Cary, Jr.....	727
Administrative Significance of Proposed Changes in Standard Methods of Water Analysis, The. John F. Norton, Ph.D.....	27
Aeberly, John J., Connolly, Joel L., and Claffy, Thomas J. Difficulties Encountered in the Con- trol of Mechanical Refrigeration.....	252
Age Studies of Poliomyelitis and What They Suggest. W. Lloyd Aycock.....	41
Agglutination Tests for the Diagnosis of Undulant Fever. S. Bayne-Jones, M.D.....	1313
Aid to More Accurate Colony Counting, An. M. O. Robinson, V.M.D.....	1232
Airplane and Yellow Fever. Editorial.....	1221
Air Travel and Public Health. Frederick L. Hoffman, LL.D.....	1129
Allen, Kenneth, Chairman. Report of the Committee on Refuse Collection and Disposal.....	509
American Health Officer and His European Brother. Editorial.....	1222
Anaerobic Bacterin, An Improved Technic in Burri's Method of Isolating Obligately. Ivan C. Hall, Ph.D.....	536
Animal Infections with Bacteria of Genus Brucella and Their Relations to Undulant Fever of Man. J. Traum.....	935
Annual Health Department Reports. Report of the Sub-Committee of the Committee on Ad- ministrative Practice. Charles V. Chapin, Chairman.....	34
Antepartum Care of the Mother, Effect of. Blanche M. Haines, M.D.....	273
Anthrax as an Occupational Disease. Report of the Committee on Anthrax. Henry Field Smyth, Chairman.....	155
Antirabic Treatment Paralysis. Editorial Section.....	412
Antiseptics. Filler.....	407
Antivivisection. Filler.....	478
Are the Indians Dying Out? Frederick L. Hoffman, LL.D.....	609
Arnold, Lloyd, M.D., and Gustafson, C. J. Home Pasteurization of Milk.....	1065
Arnold, Lloyd, M.D., and Hull, Thomas G., Ph.D. The Role of the Food Vehicle in Food Poisoning.....	287
Association News:	
Agramonte, Dr., An Honorary Fellow.....	1333
Amendment to the Constitution.....	1137
A. P. H. A. Executive Board Meeting.....	303
A. P. H. A. Represented at Latin-American Medical Congress.....	421
Announcing Unusual 10-Day Post-Convention Tour to Mexico City from Fort Worth.....	530
Annual Meeting Information.....	645, 1133
Annual Meeting Proceedings, 1929.....	61
Annual Meeting Program (note).....	871
Annual Meeting Program, Committee on.....	529
Carr, Mrs. O. E. Welcome to Texas.....	1000
Dates Changed for Western Branch Meeting.....	302
Executive Board, Meeting of.....	524
Fellowship, Applicants for.....	532, 1005, 1138
Fifty-Ninth Annual Meeting.....	643
Flickwir, A. H., M.D., Inspection Trips, Rodeo and Barbecue for A. P. H. A. Convention, Fort Worth, Texas, October 27-30, 1930.....	869
Fort Worth Convention, Real Western Entertainment at. Dr. Truman Terrell.....	1128
Fort Worth Meeting, Plans for the.....	301
German Hygiene Museum, Dresden.....	766
Governing Council, Nominations for the.....	526
Health Survey of Washington, D. C.....	305
Heulings, Samuel M., Death of.....	766
Inspection Trips, Rodeo and Barbecue for A. P. H. A. Convention, Fort Worth, Texas, October 27-30, 1930.....	869
International Congresses at Dresden.....	302
International Hygiene Congresses in Dresden.....	533
International Hygiene Exhibition.....	69
Kiefer, Guy L., dies.....	644
Mexico City, A Nine-Day, All-Expense Tour with 5 Days in.....	761
Organization of the American Public Health Association.....	1131
Post-Convention Tour of the A. P. H. A. to Mexico. Emery R. Hayhurst, M.D., Ph.D., and Williamina M. Rayne.....	1334
Preliminary Program of the Fifty-Ninth Annual Meeting A. P. H. A.....	984
Salt Lake City, Utah, Tentative Program. First Meeting Western Branch, American Public Health Association.....	527
Salt Lake City, Meeting of the Association in.....	192
Sixtieth Annual Meeting.....	1333

	Page
Slemons Michigan's New Commissioner of Health.....	766
Standing Committees of the Association.....	191
Tomalin, Arthur.....	305
Trigg, Mrs. Henry B. Women's Entertainment Committee.....	1002
Welcome to Texas.....	1000
Western Branch A. P. H. A. Meets in Salt Lake City.....	765
Women's Entertainment Committee.....	1002
Atmospheric Pollution, Some Special Problems in. Abel Wolman.....	243
Aycock, W. Lloyd. Seasonal and Age Studies of Poliomyelitis and What They Suggest.....	41
Bacteria in Cream and Ice Cream, Thermal Death Points of Pathogenic. Carolyn Olden- busch, Martin Frobisher, Jr., and J. H. Shrader, M.D.....	615
Bacteria in Pasteurized Milk, Significance of Thermophilic. L. A. Rogers, D.Sc., and W. C. Frazier, Ph.D.....	815
Bacteria in Pasteurizing Plants, The Control of Thermophilic. M. W. Yale and Robert S. Breed, Ph.D.....	1192
Bacterial Aftergrowths in Water Distribution Systems. Report of the Committee on Water Supply. John R. Baylis, Chairman.....	485
Bacteriological Basis for the Effective Pasteurization of Ice Cream. Report of the Committee on Dairy Products and Eggs. J. H. Shrader, M.D., Chairman.....	492
Bacteriological Control in Commercial Canning. E. J. Cameron, Ph.D., and H. M. Loomis....	741
Bacteriological Study of Grade A Pasteurized Milk. Cecil Brooks.....	1209
Baker, Herman M., M.D. Industrial Methyl Chloride Poisoning.....	291
Band, Marie, and Owen, Helen H. The Stoltenberg Differential Stain for Diphtheria Bacilli...	426
Banham, F. D., and Schultz, E. W., M.D. Description of a New Mechanical Disintegrator....	771
Bathing Beaches and Wading Pools, Standards for Public. Report of the Committee. Stephen DeM. Gage, Chairman.....	7
Baylis, John R., Chairman. Report of the Committee on Water Supply.....	485
Bayne-Jones, S., M.D. Agglutination Tests for the Diagnosis of Undulant Fever.....	1313
Bigelow, George H., M.D., and Forsbeck, Filip C., M.D. Milk-Borne Disease in Massachusetts, 1927-1929 .....	1094
Bishop, E. L., M.D., and Stewart, H. D., M.D. Incidence of Partial Paralysis.....	1307
Books and Reports:	
Aids to Zoology. Harry Lister.....	336
Alien in our Midst, The. Madison Grant and Charles Stewart Divison, edited by.....	682
Adventure with Children, An. Mary H. Lewis.....	225
Almack, John C., and Terman, Lewis M. The Hygiene of the School Child.....	801
Andress, J. Mace, Ph.D., and Goldberger, I. H., M.D. The Essentials of Healthy Living..	226
Annals of the Pickett-Thomson Research Laboratory, Vol. V.....	335
Art of Rapid Reading, The. Walter B. Pitkin.....	564
Artificial Sunlight—Combining Radiation for Health with Light for Vision. M. Luckiesh..	1373
Artschwager, Ernest. Dictionary of Biological Equivalents—German-English.....	1373
Assmann, H. Ergebnisse der gesamten Tuberkuloseforschung.....	1044
Babbitt, Harold E., and Doland, James J. Water Supply Engineering.....	104
Baby's First Two Years, The. Richard M. Smith.....	1044
Backgrounds of Biology. John Giesen and Thomas J. Malumphy.....	337
Bacteriophage and Its Clinical Applications, The F. D. d'Herelle.....	1265
Bainbridge, W. S. Report on Fifth International Congress of Military Medicine and Pharmacy .....	1258
Behavior of the Young Child. Ethel B. Waring and Marguerite Wilker.....	102
Benedict, Agnes E. Children at the Crossroads.....	1167
Bensted, H. J., et al. A System of Bacteriology in Relation to Medicine.....	568
Bergey, David H. Bergey's Manual of Determinative Bacteriology (3d Ed.).....	565
Bergey's Manual of Determinative Bacteriology (3d Ed.). David H. Bergey.....	565
Berry, Richard J. A., M.D. Through the States with a Seeing Eye.....	799
Besredka, A. Immunity in Infectious Diseases.....	1042
Bettors, Paul V. The Bureau of Home Economics. Its History, Activities and Organiza- tions .....	1169
Bilik, S. E., M.D. Healthful Living. The Why and the How.....	454
Biological Basis of Human Nature, The. H. S. Jennings.....	802
Bio-Dynamics: The Battle for Youth. Boris Sokoloff, M.D.....	906
Biological Stains. A Handbook on the Nature and Uses of the Dyes Employed in the Biological Laboratory. H. J. Conn, Chairman.....	105
Blanchard, Phyllis, and Groves, Ernest R. Introduction to Mental Hygiene.....	1375
Blood Picture and Its Clinical Significance, The. Dr. Victor Schilling.....	337
Blount, Ralph E. Health, Public and Personal.....	1042
Book of Crimes, A. A. S. MacNalty.....	453
Bowers, Edison L. Is It Safe to Work? A Study of Industrial Accidents.....	1379
Boysen, Dr. H. H. Gewinnung und Kontrolle der Trinkmilch.....	800
Brockbank, E. M., M.D. Incapacity or Disablement in Its Medical Aspects.....	1040
Browning, C. H., Bulloch, et al. A System of Bacteriology in Relation to Medicine, Volume II.....	1165
Buchanan, R. E., and Fulmer, Ellis I. Physiology and Biochemistry of Bacteria, Vol. II and Vol. III.....	1261
Buhler, Charlotte. The First Year of Life.....	1372
Bulloch, W., Fildes, P., et al. A System of Bacteriology in Relation to Medicine (Vol. III)	100
Bulloch, W., Browning, C. H., et al. A System of Bacteriology in Relation to Medicine, Volume II.....	1165
Bulmer, L. C., B.S. Undulant Fever and Contagious Abortion.....	907

	Page
Burdett's Hospitals and Charities, 1930.....	567
Bureau of Home Economics, The. Its History, Activities and Organizations. Paul V. Betters .....	1169
Bureau of Prohibition. Its History, Activities and Organization. Lawrence F. Schmeckebler .....	106
Burr, C. B., M.D. Practical Psychology and Psychiatry.....	906
Burt, Harold Ernest, Ph.D. Psychology and Industrial Efficiency.....	563
Carey, Harry W., M.D. Handbook of Bacteriology for Nurses.....	457
Cathcart, E. P., C.B.E., M.D. The Human Factor in Industry.....	1265
Chandler, Asa C., M.Sc. Hookworm Disease.....	226
Chandler, Asa C., M.S., Ph.D. Introduction to Human Parasitology.....	1378
Chemical Aspects of Immunity, The. H. Gideon Wells, Ph.D.....	99
Children at the Crossroads. Agnes E. Benedict.....	1167
Christian, W. G., M.D., and Haskell, C. C., M.D. Textbook of Physiology for Nurses.....	803
Clark, Austin H. The New Evolution, Zoogenesis.....	1262
Clement, Mark, and Hill, Leonard. Common Colds—Causes and Preventive Measures.....	1260
Clinical Medicine for Nurses. Paul H. Ringer, M.D.....	227
Cobb, Walter Frank, M.D. Values and Methods in Health Education.....	800
Collins, Joseph, M.D. Insomnia. How to Combat It.....	914
Committee on Uniform Street Sanitation Records of the International Association of Street Sanitation Officials, Chicago. The Measurement and Control of Municipal Sanitation.....	1377
Common Colds—Causes and Preventive Measures. Leonard Hill and Mark Clement.....	1260
Commonwealth Fund Activities in Austria, The. William F. French, M.D., and Geddes Smith .....	337
Conn, H. J., Chairman. Biological Stains—A Handbook on the Nature and Uses of the Dyes Employed in the Biological Laboratory.....	105
Control of Endemic Diseases in the Netherlands Indies.....	682
Craig, Charles F., M.D. Laboratory Methods of the United States Army.....	99
Creative Activities in Physical Education. Olive K. Horrigan.....	229
Culbert, Jane F. The Visiting Teacher at Work.....	565
Currie, J. R. A Textbook of Hygiene.....	1164
Darwin, Major Leonard. What is Eugenics?.....	796
Daukes, S. H., M.D. The Medical Museum.....	458
Davies, Stanley P., Ph.D. Social Control of the Mentally Deficient.....	909
Davis, Katherine Bement, Ph.D. Factors in the Sex Life of Twenty-two Hundred Women.....	797
Davison, Charles Stewart, and Grant, Madison, edited by. The Alien in our Midst.....	682
d'Herelle, F. D. The Bacteriophage and Its Clinical Applications.....	1265
d'Herelle, F., et al. Etudes sur le Cholera.....	911
Diagnosis of Health, The. William R. P. Emerson, M.D.....	795
Diagnostica e Tecnica de Laboratorio.....	684
Dictionary of Biological Equivalents—German-English. Ernest Artschwager.....	1373
Die Statistischen Methoden. Karl Freudenberg.....	1163
Disease and the Man. George Draper.....	453
Doctor in Court, The. Edward Huntington Williams, M.D.....	104
Doflein, Franz. Lehrbuch der Protozoenkunde.....	683
Doland, James J., and Babbitt, Harold E. Water Supply Engineering.....	104
Downing, Elliot R., Ph.D. Science in the Service of Health.....	1167
Draper, George. Disease and the Man.....	453
Drolet, Godias J., and Potter, Marguerite P. Statistical Reference Data.....	910
Dunham, George C., M.D., Dr.P.H. Military Preventive Medicine.....	1166
Eat and Be Happy. Josiah Oldfield, M.D.....	107
Eekles, C. H., D.Sc., et al. Milk and Milk Products.....	564
Eddy, Harrison P., and Metcalf, Leonard. Sewerage and Sewage Disposal. A Textbook.....	798
Effler, Louis R., M.D. Three Minute Medicine.....	230
Egbert, Seneca, M.D., Dr.P.H. Personal Hygiene for Nurses.....	1168
Einhorn, Moses, M.D., and Herbert, L. M., Editors. The Hebrew Physician.....	456
Elementary Materia Medica, Including Drugs and Solutions. Walter W. Kruger, Ph.B.....	1264
Elwyn, Adolph. Yourself, Inc.: The Story of the Human Body.....	911
Emerson, William R. P., M.D. The Diagnosis of Health.....	795
Epidemic Encephalitis. Etiology, Epidemiology, Treatment. Matheson Commission Report.....	336
Epidemiology and Control of Malaria in Palestine, The. Israel J. Kligler.....	683
Ergebnisse der gesamten Tuberkuloseforschung. H. Assmann.....	1044
Essentials of Healthy Living, The. J. Mace Andress, Ph.D., and I. H. Goldberger, M.D.....	226
Essentials of Pediatric Nursing. Ruth Alice Perkins, R.N.....	1164
Etudes sur le Cholera. F. d'Herelle.....	911
Ewing, Henry Ellsworth. A Manual of External Parasites.....	105
Factors in the Sex Life of Twenty-two Hundred Women. Katherine Bement Davis, Ph.D.....	797
Federal Limitations upon Municipal Ordinance Making Power. Harvey Walker.....	103
Feeding the Family. Mary Swartz Rose, Ph.D.....	457
Field, Robert S. New Uses for Capital.....	907
Fildes, P., Bulloch, W., et al. A System of Bacteriology in Relation to Medicine (Vol. III) .....	100
First Year of Life, The. Charlotte Buhler.....	1372
Fischer, Louis, M.D. The Health Care of the Baby.....	803
Fishbein, Morris, M.D. Shattering Health Superstitions.....	796
Fisher, H. A. L. Our New Religion. An Examination of Christian Science.....	911
Franzen, Raymond, Ph.D. Public Health Aspects of Dental Decay in Children.....	908

	Page
Fraser, A. J., M.D. Trauma, Disease, Compensation—A Handbook of Their Medico-Legal Relations .....	1373
French, William J., M.D., and Smith, Geddes. The Commonwealth Fund Activities in Austria .....	337
Freudenberg, Karl. Die Statistischen Methoden.....	1163
Fulmer, Ellis I., and Buchanan, R. E. Physiology and Biochemistry of Bacteria, Vol. II and Vol. III.....	1261
Fulmer, Ellis I., Ph.D., and Werkman, C. H., Ph.D. An Index to the Chemical Action of Microorganisms on the Non-Nitrogenous Organic Compounds.....	912
Fundamentals of Bacteriology. Charles Bradfield Morrey.....	1040
Gesundheitswesen und Wohlfahrtspflege im Deutschen Reiche. Dr. Bernhard Möllers....	907
Getting Well and Staying Well. John Potts, M.D.....	1045
Gewinnung und Kontrolle der Trinkmilch. Dr. H. H. Boysen.....	800
Giesen, John, and Malumphy, Thomas L. Backgrounds of Biology.....	337
Goldberger, I. H., M.D., and Andress, J. Mace, Ph.D. The Essentials of Healthy Living..	226
Goodman, Herman, B.S., M.D. Sanitation, Hygiene, Bacteriology and Sterilization.....	912
Goodwin, George M., M.D., and Lambert, Samuel W., M.D. Medical Leaders. From Hippocrates to Osler.....	228
Gould, Adrian Gordon, Smiley, Dean Franklin, and Melby, Elizabeth. The Principles and Practice of Hygiene.....	1263
Grant, Madison, and Davison, Charles Stewart, Editors. The Alien in our Midst.....	682
Groves, Ernest R., and Blanchard, Phyllis. Introduction to Mental Hygiene.....	1375
Guy, John, and Linklater, G. J. I. Hygiene for Nurses.....	1041
Haibe, M. A. Pathogenie et traitement de l'asthme bronchique.....	458
Haines, Anna J. Health Work in Soviet Russia.....	464
Hallock, Grace T., and Peter, W. W., M.D., Dr.P.H. Hitch-Hikers.....	1170
Hallock, Grace T., and Turner, C. E. Health Heroes. Edward Livingston Trudeau.....	801
Handbook of Bacteriology for Nurses. Harry W. Carey, M.D.....	457
Handbook of Physical Education. Ernest G. Schroeder.....	1039
Handbook of the Mosquitoes of North America. A. Robert Matheson.....	801
Haskell, C. C., M.D., and Christian, W. G., M.D. A Textbook of Physiology for Nurses..	803
Haslam, J. F. C., M.D. Recent Advances in Preventive Medicine.....	563
Haslam, J. F. C., M.D. Schistosomiasis and Malaria in Relation to Irrigation.....	455
Health Care of the Baby, The. Louis Fischer, M.D.....	803
Health Heroes. Edward Livingston Trudeau. Grace T. Hallock and C. E. Turner.....	801
Health, Public and Personal. Ralph E. Blount.....	1042
Health Revue, A. Margaret Strassler.....	803
Health. What Everyone Ought to Know. Oliver T. Osborne, M.D.....	229
Healthful Living. The Why and the How. S. E. Bilik, M.D.....	454
Health Work in Soviet Russia. Anna J. Haines.....	454
Healthy Mind, The. Mental Hygiene for Adults. Joseph Jastrow, Douglas Thom, et al..	681
Hebrew Physician, The. Moses Einhorn, M.D., and L. M. Herbert, Editors.....	456
Hedden, W. P. How Great Cities Are Fed.....	680
Herbert, L. M., and Einhorn, Moses, M.D., Editors. The Hebrew Physician.....	456
Hess, Alfred F., M.D. Rickets Including Osteomalacia and Tetany.....	103
Hill, Leonard, and Clement, Mark. Common Colds—Causes and Preventive Measures.....	1260
History of Haitian Medicine. Robert P. Parsons.....	1168
History of Nursing and Sociology.....	913
Hitch-Hikers. W. W. Peter, M.D., Dr.P.H., and Grace T. Hallock.....	1170
Hogarth, A. Moore, F.E.S. The Rat. A World Menace.....	567
Home Nursing and Child Care. C. E. Turner, Dr.P.H., et al.....	456
Hookworm Disease. Asa C. Chandler, M.Sc.....	226
Horrigan, Olive K. Creative Activities in Physical Education.....	229
How Great Cities Are Fed. W. P. Hedden.....	680
Human Factor in Industry, The. E. P. Cathcart, C.B.E., M.D.....	1265
Hygiene for Nurses. John Guy and G. J. I. Linklater.....	1041
Hygiene of the School Child, The. Lewis M. Terman and John C. Almack.....	801
Immunity in Infectious Diseases. A. Besredka.....	1042
Immunology of Parasitic Infections, The. William H. Talliaferro, Ph.D.....	797
Incapacity or Disablement in Its Medical Aspects. E. M. Brockbank, M.D.....	1040
Index to the Chemical Action of Microorganisms on the Non-Nitrogenous Organic Compounds. Ellis I. Fulmer, Ph.D., and C. H. Werkman, Ph.D.....	912
Industrial Hygiene for Schools. Jesse Feiring Williams and Delbert Oberteuffer.....	1372
Infant Nutrition. A Textbook of Infant Feeding for Students and Practitioners of Medicine. William McKim Marriott, B.S., M.D.....	1162
Insects, Ticks, Mites and Venomous Animals of Medical and Veterinary Importance. Walter Scott Patton, M.B., et al.....	680
Insomnia. How to Combat It. Joseph Collins, M.D.....	914
Introduction to Mental Hygiene. Ernest R. Groves and Phyllis Blanchard.....	1375
Introduction to Human Parasitology. Asa C. Chandler, M.S., Ph.D.....	1378
Is It Safe to Work? A Study of Industrial Accidents. Edison L. Bowers.....	1379
Jastrow, Joseph, Thom, Douglas, et al. The Healthy Mind. Mental Hygiene for Adults..	681
Jenkins, Elizabeth Blaine. Stories of Health and Happiness.....	1044
Jennings, H. S. The Biological Basis of Human Nature.....	802
Kaye-Smith, Sheila. The Village Doctor.....	568
Kilgler, Israel J. The Epidemiology and Control of Malaria in Palestine.....	683
Kochler, John P., M.D. The Road to Health.....	454
Kopeloff, Nicholas. Man vs. Microbes.....	1164



	Page
Kruger, Walter W., Ph.B. Elementary Materia Medica, Including Drugs and Solutions..	1264
Laboratory Methods of the U. S. Army. Charles F. Craig, M.D.....	99
Laboratory Testing of Germicides and Chemo-Therapeutic Agents. Otto Schobl.....	683
Laird, Donald A., and Muller, Charles G. Sleep. Why We Need It and How to Get It....	1261
Lambert, Samuel W., M.D., and Goodwin, George W., M.D. Medical Leaders. From Hip- pocrates to Osler.....	228
Laton, Anita Duncan, Ph.D. The Psychology of Learning Applied to Health Education through Biology.....	679
Laws Concerning Birth Control in the United States.....	101
Lead Poisoning. Report of the Committee.....	684
Lehmann K. B. Lehmann's Medical Hand Atlases.....	1043
Lehmann's Medical Hand Atlases. K. B. Lehmann.....	1043
Lehrbuch der Protzoenkunde. Franz Doflein.....	683
Lewis, Mary H. An Adventure with Children.....	225
Linklater, G. J. I., and Guy, John. Hygiene for Nurses.....	1041
Lister, Harry. Aids to Zoology.....	336
Luckiesh, M. Artificial Sunlight—Combining Radiation for Health with Light for Vision..	1373
Lutman, Benjamin Franklin. Microbiology.....	225
MacNalty, A. S. A Book of Crimes.....	453
Malumphy, Thomas L., and Giesen, John. Backgrounds of Biology.....	337
Manual of External Parasites, A. Henry Ellsworth Ewing.....	105
Man vs. Microbes. Nicholas Kopeloff.....	1164
Marriott, Williams McKim, B.S., M.D. Infant Nutrition. A Textbook of Infant Feeding for Students and Practitioners of Medicine.....	1162
Matheson Commission Report. Epidemic Encephalitis. Etiology, Epidemiology, Treat- ment .....	336
Matheson, Robert. A Handbook of the Mosquitoes of North America.....	801
McClendon, J. F., Ph.D. Pettibones Physiological Chemistry.....	1266
Meat Through the Microscope. C. Robert Moulton, Ph.D.....	102
Measurement and Control of Municipal Sanitation. Committee of Uniform Street Sanita- tion Records of the International Association of Street Sanitation Officials, Chicago...	1377
Medical Information in Sickness and Health. Philip Skrainka, M.D.....	227
Medical Leaders. From Hippocrates to Osler. Samuel W. Lambert, M.D., and George W. Goodwin, M.D.....	228
Medical Museum, The. S. H. Daukes, M.D.....	458
Megaw, John W. D., and Rogers, Sir Leonard. Tropical Medicine.....	1258
Melby, Elizabeth, Smiley, Dean Franklin, and Gould, Adrian Gordon. The Principles and Practice of Hygiene.....	1263
Mendenhall, Walter L., M.D. Tobacco.....	1374
Mental Hygiene. Special International Congress Number, April, 1930.....	1039
Merrill, H. G., M.D., and Oaks, L. W., M.D. Your Nose, Throat and Ears.....	907
Metcalf, Leonard, and Eddy, Harrison P. Sewerage and Sewage Disposal. A Textbook..	798
Microbiology. Benjamin Franklin Lutman.....	225
Military Preventive Medicine. George C. Dunham, M.D., Dr.P.H.....	1166
Milk and Milk Products. C. H. Eckles, D.Sc., et al.....	564
Mollers, Dr. Bernhard. Gesundheitswesen und Wohlfahrtspflege im Deutschen Reiche..	907
Moulton, C. Robert, Ph.D. Meat Through the Microscope.....	102
Muller, Charles G., and Laird, Donald A. Sleep. Why We Need It and How to Get It....	1261
Municipal Index, 1930.....	909
Munthe, Axel. The Story of San Michele.....	795
Myers, J. Arthur. Tuberculosis Among Children.....	1375
Nash, Jay B., et al. Symposium on Physical Education and Health.....	914
National Conference of Social Work at San Francisco, June 1929.....	681
Nature Study and Health Education. Alice Jean Patterson.....	228
New Evolution, The, Zoogenesis. Austin H. Clark.....	1262
New Uses for Capital. Robert S. Field.....	907
Ninth Annual Report of the Ohio Conference on Water Purification.....	1260
Nusbaum, Hermien D. Our Baby's First Seven Years.....	566
Oaks, L. W., M.D., and Merrill, H. G., M.D. Your Nose, Throat and Ears.....	907
Oberteuffer, Delbert, and Williams, Jesse Feiring. Industrial Hygiene for Schools.....	1372
Odencrantz, Louise C. The Social Worker in Family, Medical and Psychiatric Social Work	913
Oldfield, Josiah, M.D. Eat and Be Happy.....	107
Oliver, Wade W., M.D. Stalkers of Pestilence. The Story of Man's Ideas of Infection....	1259
Osborne, Oliver T., M.D. Health. What Everyone Ought to Know.....	229
Our Baby's First Seven Years. Hermien D. Nusbaum.....	566
Our New Religion. An Examination of Christian Science. H. A. L. Fisher.....	911
Park, William H., M.D., et al. Pathogenic Microorganisms.....	230
Parsons, Robert P. History of Haitian Medicine.....	1163
Pathogenic Microorganisms. William H. Park, M.D., et al.....	230
Pathogenie et traitement de l'asthme bronchique. M. A. Haibe.....	458
Patterson, Alice Jean. Nature Study and Health Education.....	228
Patton, Walter Scott, M.B., et al. Insects, Ticks, Mites and Venomous Animals of Medical and Veterinary Importance.....	680
Perkins, Ruth Alice, R.N. Essentials of Pediatric Nursing.....	1164
Personal Hygiene for Nurses. Seneca Egbert, M.D., Dr.P.H.....	1168
Peter, W. W., M.D., Dr.P.H., and Hallock, Grace T. Hitch-Hickers.....	1170
Pettibones Physiological Chemistry. J. F. McClendon, Ph.D.....	1266

## INDEX

	Page
Physiology and Biochemistry of Bacteria. Vol. II and Vol. III. R. E. Buchanan and Ellis I. Fulmer .....	1261
Physiology and Health. C. E. Turner.....	679
Physiology of Oral Hygiene and Recent Research, The. J. Sim Wallace, D.Sc., M.D.....	680
Pioneers of Public Health. The Story of Some Benefactors of the Human Race. M. E. M. Walker .....	1263
Pitkin, Walter B. The Art of Rapid Reading.....	564
Popenoe, Paul. Practical Applications of Heredity.....	1378
Potter, Marguerite P., and Drolet, Godias J. Statistical Reference Data.....	910
Potts, John, M.D. Getting Well and Staying Well.....	1045
Practical Applications of Heredity. Paul Popenoe.....	1378
Practical Handbook for Diabetic Patients. Abraham Rudy, M.D.....	455
Practical Medical Dictionary, A. Thomas Lathrop Stedman, M.D.....	1374
Practical Psychology and Psychiatry. C. B. Burr, M.D.....	906
Principles and Practice of Hygiene, The. Dean Franklin Smiley, Adrian Gordon Gould and Elizabeth Melby.....	1263
Proceedings of the Seventh Annual Short School. Texas Association of Sanitaricians.....	1042
Proceedings of the Third Annual Conference of the Maryland Water and Sewerage Association, Salisbury, Md., 1929.....	227
Proceedings of the Twelfth Texas Water Works Short School.....	1259
Psychology and Industrial Efficiency. Harold Ernest Burtt, Ph.D.....	503
Psychology for Executives. Elliott Dunlap Smith.....	1169
Psychology of Learning Applied to Health Education through Biology, The. Anita Duncan Laton, Ph.D.....	679
Public Health Aspects of Dental Decay in Children. Raymond Franzen, Ph.D.....	908
Rat, The. A World Menace. A. Moore Hogarth, F.E.S.....	567
Recent Advances in Preventive Medicine. J. F. C. Haslam, M.D.....	503
Report of the Second Laboratory Conference on the Serodiagnosis of Syphilis.....	106
Report of the Westchester County Sanitary Sewer Commission, 1929.....	456
Report on Fifth International Congress of Military Medicine and Pharmacy W. S. Bainbridge .....	1258
Report on Methods of Analyzing Butter.....	1376
Rest-Pauses in Industry. S. Wyatt, M.Sch.....	1041
Rickets Including Osteomalacia and Tetany. Alfred F. Hess, M.D.....	103
Ringer, Paul H., M.D. Clinical Medicine for Nurses.....	227
Road to Health, The. John P. Koehler, M.D.....	454
Road to Health, The. C.-E. A. Winslow, Dr.P.H.....	99
Rogers, Sir Leonard, and Megaw, John W. D. Tropical Medicine.....	1258
Rose, Mary Swartz, Ph.D. Feeding the Family.....	457
Rosewarne, D. D., M.R.C.S. The Science of Nutrition Simplified.....	228
Rudy, Abraham, M.D. Practical Handbook for Diabetic Patients.....	455
Sanitation, Hygiene, Bacteriology and Sterilization. Herman Goodman, B.S., M.D.....	912
Schilling, Dr. Victor. The Blood Picture and Its Clinical Significance.....	337
Schistosomiasis and Malaria in Relation to Irrigation. J. F. C. Haslam, M.D.....	455
Schmeckebier, Lawrence F. The Bureau of Prohibition. Its History, Activities and Organization .....	106
Schohl, Otto. Laboratory Testing of Germicides and Chemo-Therapeutic Agents.....	683
Schroeder, Ernest G. Handbook of Physical Education.....	1039
Science in the Kitchen. The Selection, Care and Service of Foods.....	1374
Science in the Service of Health. Elliot R. Downing, Ph.D.....	1167
Science of Biology, The. George G. Scott, Ph.D.....	1259
Science of Nutrition Simplified, The. D. D. Rosewarne, M.R.C.S.....	228
Scott, George G., Ph.D. The Science of Biology.....	1259
Second Annual Report of the Metropolitan Drainage Commission of Minneapolis and St. Paul .....	333
Second Annual Report of Ohio Conference on Sewage Treatment.....	455
Sewerage and Sewage Disposal. A Textbook. Leonard Metcalf and Harrison P. Eddy.....	798
Shattering Health Superstitions. Morris Fishbein, M.D.....	796
Skrainka, Philip, M.D. Medical Information in Sickness and Health.....	227
Sleep. Why We Need It and How to Get It. Donald A. Laird and Charles G. Muller.....	1261
Smiley, Dean Franklin, Gould, Adrian Gordon, and Melby, Elizabeth. The Principles and Practice of Hygiene.....	1263
Smith, Geddes, and French, William J., M.D. The Commonwealth Fund Activities in Austria .....	337
Smith, Elliott Dunlap. Psychology for Executives.....	1169
Smith, Richard M. The Baby's First Two Years.....	1044
Social Control of the Mentally Deficient. Stanley P. Davies, Ph.D.....	909
Social Worker in Family, Medical and Psychiatric Social Work, The. Louise C. Odenrantz .....	913
Sokoloff, Boris, M.D. Bio-Dynamics: The Battle for Youth.....	906
Some Methods for the Prevention of Tuberculosis. W. Bolton Tomson, M.D.....	101
Stalkers of Pestilence. The Story of Man's Ideas of Infection. Wade W. Oliver, M.D.....	1259
Statistical Reference Data. Godias J. Drolet and Marguerite P. Potter.....	910
Stedman, Thomas Lathrop, M.D. A Practical Medical Dictionary.....	1374
Stories of Health and Happiness. Elizabeth Blaine Jenkins.....	1044
Story of San Michele, The. Axel Munthe.....	795
Strassler, Margaret. A Health Revue.....	803
Study Guide Text-book in the Principles and Practice of Nursing. Lulu K. Wolf.....	1378

	Page
Survey of the Law Concerning Dead Human Bodies. George H. Weinmann, LL.B.....	910
Symposium on Physical Education and Health. Jay B. Nash, et al.....	314
System of Bacteriology in Relation to Medicine, A. H. J. Bensted, et al.....	568
System of Bacteriology in Relation to Medicine, A. Volume II. C. H. Browning, W. Bulloch, et al.....	1165
System of Bacteriology in Relation to Medicine (Vol. III), A. W. Bulloch, P. Fildes, et al.	100
Tallaferro, William H., Ph.D. The Immunology of Parasitic Infections.....	797
Terman, Lewis M., and Almack, John C. The Hygiene of the School Child.....	801
Texas Association of Sanitarrians, Edinburg, Texas, 1929. Proceedings of the Seventh Annual Short School.....	1042
Textbook of Hygiene, A. J. R. Currie.....	1164
Textbook of Physiology for Nurses. W. G. Christian, M.D., and C. C. Haskell, M.D.....	803
Three Minute Medicine. Louis R. Efler, M.D.....	230
Thom, Douglas, Jastrow, Joseph, et al. The Health Mind. Mental Hygiene for Adults...	681
Tropical Medicine. Sir Leonard Rogers and John W. D. Megaw.....	1258
Through the States with a Seeing Eye. Richard J. A. Berry, M.D.....	799
Tobacco. Walter L. Mendenhall, M.D.....	1374
Tomson, W. Bolton, M.D. Some Methods for the Prevention of Tuberculosis.....	101
Trauma, Disease, Compensation—A Handbook of Their Medico-Legal Relations. A. J. Fraser, M.D.....	1373
Tuberculosis Among Children. J. Arthur Myers.....	1375
Turner, C. E., Dr.P.H., et al. Home Nursing and Child Care.....	456
Turner, C. E. Physiology and Health.....	679
Turner, C. E., and Hallock, Grace T. Health Heroes. Edward Livingston Trudeau.....	801
Undulant Fever and Contagious Abortion. L. C. Bulmer, B.S.....	907
Values and Methods in Health Education. Walter Frank Cobb, M.D.....	800
Village Doctor, The. Sheila Kaye-Smith.....	568
Visiting Teacher at Work, The. Jane F. Culbert.....	565
Walker, Harvey. Federal Limitations upon Municipal Ordinance Making Power.....	103
Walker, M. E. M. Pioneers of Public Health.....	1263
Wallace, J. Sim, D.Sc., M.D. The Physiology of Oral Hygiene and Recent Research.....	680
Waring, Ethel B., and Wilker, Marguerite. Behavior of the Young Child.....	102
Water Supply Engineering. Harold E. Babbitt and James J. Doland.....	104
Weinmann, George H., LL.B. A Survey of the Law Concerning Dead Human Bodies.....	910
Wells, H. Gideon, Ph.D. The Chemical Aspects of Immunity.....	99
Werkman, C. H., Ph.D., and Fulmer, Ellis I., Ph.D. An Index to the Chemical Action of Microorganisms on the Non-Nitrogenous Organic Compounds.....	912
What is Eugenics? Major Leonard Darwin.....	796
Wiley, Harvey W. An Autobiography.....	1162
Wilker, Marguerite, and Waring, Ethel B. Behavior of the Young Child.....	102
Williams, Edward Huntington, M.D. The Doctor in Court.....	104
Williams, Jesse Feiring, and Oberteuffer, Delbert. Industrial Hygiene for Schools.....	1372
Winslow, C.-E. A., Dr.P.H. The Road to Health.....	99
Wolf, Lulu K. A Study Guide Text-book in the Principles and Practice of Nursing.....	1378
Wyatt, S., M.Sc. Rest-Pauses in Industry.....	1041
Your Nose, Throat and Ears. L. W. Oaks, M.D., and H. G. Merrill, M.D.....	907
Yoursell, Inc.: The Story of the Human Body. Adolph Elwyn.....	911
<b>Boulder Dam Symposium.</b>	
The Sanitary Engineering Aspect. Leon B. Reynolds.....	1071
The Immigration Aspect. Fred T. Foard, M.D.....	1080
Problems of Sanitation at Headquarters Area During Construction of Boulder Dam. H. B. Hommon.....	1086
Bowden, David T., M.D., Turley, L. A., Ph.D., and Shoemaker, H. A. The Incidence of "Jake" Paralysis in Oklahoma.....	1179
Boynton, Perkins. Manganese in River Water and Its Removal.....	1346
Breed, Robert S., Ph.D., and Yale, M. W. The Control of Thermophilic Bacteria in Pasteurizing Plants.....	1192
Brickenden, F. M. A Typhoid Fever Epidemic in the Far North.....	543
Brooks, Cecil. A Bacteriological Study of Grade A Pasteurized Milk.....	1209
Brucella and their Relation to Undulant Fever of Man, Animal Infections with Bacteria of Genus. J. Traum.....	935
Bullowa, Jesse G. M., M.D., and Schuman, Audrey H. A Rapid Method of Using the Sabin Slide Microscopic Test for Determining the Types of Pneumococci.....	878
Bunker, John W. M., Ph.D., and Harris, Robert S., S.B. The Precise Evaluation of Light Therapy in Experimental Rickets.....	1287
Burri's Method of Isolating Obligately Anaerobic Bacteria, An Improved Technic in. Ivan C. Hall, Ph.D.....	536
Butterworth, William. Inter-Chamber Health Conservation Contest.....	632
Cameron, E. J., Ph.D., and Loomis, H. M. Bacteriological Control in Commercial Canning...	741
Cancer Death Rates, Smoke and Topography. Jerome Meyers, M.D.....	581
Cancer. Editorial.....	860
Cancer, Hospital Facilities for the Treatment of. Susan M. Wood.....	849
Cancer Morbidity Statistics, Need for. Francis Carter Wood, M.D.....	11
Cancer Mortality Statistics, Problems of. H. E. Robertson, M.D.....	257
Canning, Bacteriological Control in Commercial. E. J. Cameron, Ph.D., and H. M. Loomis...	741
Care of Communicable Diseases in General Hospitals. James Wallace, M.D.....	722
Cary, William H., Jr. Administration of Swimming Pool Standards in Detroit.....	727
Cause of Mustiness in Eggs, The. M. P. Spanswick.....	73

	Page
Chapin, Charles V., Chairman. Report of the Sub-Committee on Annual Health Department Reports of the Committee on Administrative Practice.....	34
Chase, Ira C., M.D. The Host City for 1930.....	522
Chesley, A. J., M.D. Time, Cooperation and Research Measure Success in Health Work.....	1275
Chlorinated Copperas, Water Treatment with. A. Clinton Decker and H. G. Menke.....	357
"Chlorine Death Points" of Bacteria, The Minimal. Fred O. Tonney, M.D., Frank E. Greer and George F. Liebig, Jr.....	503
Claffy, Thomas J., Aeberly, John J., and Connolly, Joel I. Difficulties Encountered in the Control of Mechanical Refrigeration.....	252
Clinic at the Office of the Family Physician and Pediatrician, The Well Baby. E. J. Huenekens, M.D. ....	747
Clinics for the Preschool Child, Free. Shirley W. Wynne, M.D., Dr.P.H.....	263
Cohen, Chester. Discussion of Bacterial Aftergrowths in Water Distribution Systems by John R. Baylis, Chairman.....	489
Collection of Records, Some Difficulties in the. Stewart G. Thompson, D.P.H.....	161
Collins, Selwyn D., Ph.D. The Influenza Epidemic of 1928-1929 with Comparative Data for 1918-1919.....	119
Collinson, John, M.D., Dr.P.H. Report of Visits to Local Registrars of Vital Statistics in Maryland.....	839
Colony Counting, An Aid to More Accurate. M. O. Robinson, V.M.D.....	1232
Comminution of Blood Clots for Cultures, The. T. F. Sellers and Janie F. Morris.....	195
Committee on Administrative Practice. A Survey Schedule for Industrial Hygiene.....	365
Commercial Cooperation and Public Health. Editorial.....	1120
Common Cold, Elusive Features in the Epidemiology of the. Wade H. Frost, M.D.....	843
Communicable Diseases in General Hospitals, Care of. James Wallace, M.D.....	722
Communicable Disease Service, The Duties of the Nursing Staff in a Health Department. Agnes J. Martin, R.N.....	21
Congress Authorizes National Institute of Health. Editorial.....	760
Connolly, Joel I., Claffy, Thomas J., and Aeberly, John H. Difficulties Encountered in the Control of Mechanical Refrigeration.....	252
Constitution and By-Laws and Constitution for Sections, American Public Health Association Control of Thermophilic Bacteria in Pasteurizing Plants, The. M. W. Yale and Robert S. Breed, Ph.D.....	862
Convalescent Serum Clinic. Edgar E. Martmer, M.D.....	1192
Convenient Mixing Can for Use in Preparing Diphtheria Toxin-Antitoxin Mixture, A. George F. Leonard, M.D.....	1343
Convenient Platinum Needle. C. S. Mudge.....	879
Copperas, Water Treatment with Chlorinated. A. Clinton Decker and H. G. Menke.....	195
Counting Stand, Muer's Bacterial. Frank E. Hale, Ph.D.....	357
Cream and Ice Cream, Thermal Death Points of Pathogenic Bacteria in. Carolyn Oldenbusch, Martin Frobisher, Jr., and J. H. Shrader, M.D.....	653
Cummings, G. D. A Rapid Method for Pipetting Broth in Measured Amounts.....	615
Cummings, G. D. A Sterile Dispensing Funnel.....	72
Dalton, Charles F., M.D. Health Aspects of Summer Recreation.....	1231
Dappert, Anselmo E., and Ferguson, Harry F. Illinois Mobile Water and Sewage Laboratory	697
Davis, Walter S. The Use of Sodium Hypochlorites to Preserve Milk.....	80
DDE, The—A New Research Microscope for the Scientist. R. W. Abell.....	308
Decker, A. Clinton, and Menke, H. G. Water Treatment with Chlorinated Copperas.....	654
DeKleine, William, M.D. Public Health and Medical Problems in Disasters.....	357
Delta Omega Publication. Filler.....	479
Description of a New Mechanical Disintegrator. E. W. Schultz, M.D., and F. D. Banham.....	367
Detection of Indol in Bacterial Cultures. D. C. B. Duff.....	771
Detroit, Administration of Swimming Pool Standards in. William H. Cary, Jr.....	1012
Dovereux, E. D. Preparation of Acidophilus Milk from Milk Treated by Electricity.....	727
Diagnosis of Undulant Fever, Agglutination Tests for the. S. Bayne-Jones, M.D.....	1009
Difficulties Encountered in the Control of Mechanical Refrigeration. Joel I. Connolly, Thomas J. Claffy and John J. Aeberly.....	1313
Diphtheria Bacilli, The Stoltenberg Differential Stain for. Helen H. Owen and Marie Band..	252
Diphtheria Toxin-Antitoxin Mixture, A Convenient Mixing Can for Use in Preparing. George F. Leonard, M.D.....	426
Disasters, Public Health and Medical Problems in. William DeKleine, M.D.....	879
Disintegrator, Description of a New Mechanical. E. W. Schultz, M.D., and F. D. Banham....	479
Doctor's Income and Preventive Medicine, The. Editorial.....	771
Downes, Jean. Sickness Records in School Hygiene.....	51
Drolet, Godias J., and Guilfooy, William H., M.D. Organization of Local Health Area Statistics in New York City.....	1199
Duff, D. C. B. Detection of Indol in Bacterial Cultures.....	380
Dust on the Lungs, Effect of. Report of the Committee on Silicosis. R. R. Sayers, Chairman	1012
Duties of the Nursing Staff in a Health Department Communicable Disease Service. Agnes J. Martin, R.N.....	368
Editorials:	21
Accepted Foods.....	640
Airplane and Yellow Fever, The.....	1221
Air Conditioning for Premature Infants.....	1329
American Health Officer and His European Brother, The.....	1222
Antirabic Treatment Paralysis.....	412
Cancer.....	860
Commercial Cooperation and Public Health.....	1120

	Page
Congress Authorizes National Institute of Health.....	760
Doctor's Income and Preventive Medicine, The.....	51
Epidemiology of Typhus, The.....	1123
First International Congress on Mental Hygiene.....	416
Forensic Blood Tests.....	414
Fort Worth Meeting, The.....	1328
Glucose ("Corn Sugar," So-Called) in Foods Undeclared on Labels.....	1121
Health Contest Awards.....	641
Health Councils.....	519
How Much Toxin-Antotoxin is Necessary.....	413
Increase in Malaria.....	185
Lübeck Affair, The.....	1122
Mental Hygiene .....	858
Mexican Leadership in Public Health.....	978
Mouth Spray and Puerperal Fever.....	932
National Movement for Cleaner Cities, A.....	296
New Journal, A. Municipal Sanitation.....	300
New Use for the Malarial Parasite, A.....	51
Progress on Federal Health Correlation.....	638
Psittacosis .....	756
Public Health Department in Mexico City, The.....	1125
Respiratory Diseases and Disability.....	299
Serum Treatment of Meningitis.....	518
Sewage and Conservation.....	520
Ship Doctor and Public Health, The.....	981
Should Certified Milk be Pasteurized?.....	183
Streptococci, Tonsils and Rheumatism.....	297
Teeth and Diet, The.....	1331
Use of Irradiated Foods, The.....	182
Vaccine and Vaccination.....	1224
Ventilation and Comfort.....	49
What is the Saturation Point for City Noise?.....	758
X-Rays and the Public Health.....	185
Effective and Practical Definition of Pasteurization, An. Leslie C. Frank, C.E.....	1105
Effect of Antepartum Care of the Mother. Blanche M. Haines, M.D.....	273
Effect of Dust on the Lungs. Report of the Committee on Silicosis. R. R. Sayers, Chairman..	368
Effect of Intranatal Care upon the Infant. Walter R. Ramsey, M.D.....	271
Effect of Prenatal Care upon the Infant. Clifford G. Grulee, M.D.....	269
Eggs, The Cause of Mustiness in. M. P. Spanswick.....	73
Ehlers, V. M., Secretary, Report of the Committee on Rural Sanitation.....	619
Electric Kjeldahl Nitrogen without Fume Hood. W. D. Stovall, M.D., and M. Starr Nichols, Ph.D. ....	772
Elusive Features in the Epidemiology of the Common Cold. Wade H. Frost, M.D.....	843
Epidemiology in State and City Health Organizations. John A. Ferrell, M.D.....	623
Epidemiology of Pneumococcus Infections, Value of the Newly Identified Types in the Study of the. William H. Park, M.D.....	403
Epidemiology of Typhus. Editorial.....	1123
Established Points in a Community Program of Health Education. Henry F. Vaughan, D.P.H. ....	351
Evolving a Health Department. Ennion G. Williams, M.D.....	1293
Fales, W. Thurber. Discussion of Report of Visits to Local Registrars of Vital Statistics in Maryland by John Collinson, M.D., Dr.P.H.....	841
Faville, Katherine, R.N. Responsibility of the Public Health Nurse for Social Phases of Her Work.....	165
Fellers, Carl R., Ph.D. Pasteurized Dried Fruits.....	175
Ferguson, H. F. Stream Pollution Control in Illinois.....	201
Ferguson, Harry F., and Dappert, Anselmo F. Illinois Mobile Water and Sewage Laboratory	80
Ferguson, Lee H., M.D. Pulmonary Tuberculosis in Students.....	955
Ferrell, John A., M.D. Epidemiology in State and City Health Organizations.....	623
Filby, E. L., Chairman. Report of the Committee on Disaster Relief.....	469
Financing Home Sanitary Facilities on the Easy Payment Plan. Report of the Committee on Rural Sanitation. V. M. Ehlers, Chairman.....	619
First Aid Cabinet of a School Nurse, Her Standing Order for First Aid, and Her School Nursing Procedure. Charles Christopher Wilson, M.D.....	147
First International Congress on Mental Hygiene. Editorial.....	416
Foard, Fred T., M.D. Boulder Dam Symposium.....	1080
Food Poisoning, The Role of the Food Vehicle in. Thomas G. Hull, Ph.D., and Lloyd Arnold, M.D. ....	287
Forensic Blood Tests. Editorial.....	414
Forsbeck, Filip C., M.D., and Bigelow, George H., M.D. Milk-Borne Disease in Massachusetts, 1927-1929 .....	1094
Fort Worth, the 59th Annual Meeting City, History of.....	418
Frank, Leslie C., C.E. An Effective and Practical Definition of Pasteurization.....	1105
Frankel, Emil, and Heyer, Helen E. Tuberculous Patients in New Jersey Sanatoriums.....	969
Frazier, W. C., Ph.D., and Rogers, L. A., D.Sc. Significance of Thermophilic Bacteria in Pasteurized Milk.....	815
Free Clinics for the Preschool Child. Shirley W. Wynne, M.D., Dr.P.H.....	263

	Page
Frobisher, Martin, Jr., Shrader, J. H., M.D., and Oldenbusch, Carolyn. Thermal Death Points of Pathogenic Bacteria in Cream and Ice Cream.....	615
Frost, Wade H., M.D. Elusive Features in the Epidemiology of the Common Cold.....	843
Fruits, Pasteurized Dried. Carl R. Fellers, Ph.D.....	175
Funnel, A Sterile Dispensing. G. D. Cummings.....	1231
Gage, Stephen DeM., Chairman. Report of the Committee on Bathing Places.....	7
Galdston, Iago, M.D. How to Tell What.....	171
Geiger, J. C., M.D. The Training of Health Officers.....	1055
Georgia's Surgical Pioneers. Filler.....	164
Gilbert, Ruth, M.D., Referee. Abstract of Progress Report of the Committee. Standardization of the Wassermann Test.....	47
Gilbert, Ruth, M.D., and Groesbeck, William M. A Study of Cultures of Monilia Isolated from Sputum.....	1
Glassware, A Storage Bin for Laboratory. C. S. Mudge.....	1141
Gordon, Faith Fairfield, M.D. Physical Measurements of One Thousand Smith College Students.....	963
Graf, August V. A Low Reading Turbidimeter.....	309
Glucose ("Corn Sugar," So-Called) in Foods. Editorial.....	1121
Greer, Frank E., Liebig, George F., Jr., and Tonney, Fred O., M.D. The Minimal "Chlorine Death Points" of Bacteria.....	503
Grim, George W., V.M.D. Discussion of paper by Leslie C. Frank, "An Effective and Practical Definition of Pasteurization".....	1110
Groesbeck, William M., and Gilbert, Ruth M., M.D. A Study of Cultures of Monilia Isolated from Sputum.....	1
Grulee, Clifford G., M.D. Effect of Prenatal Care upon the Infant.....	269
Guilfooy, William H., M.D., and Drolet, Godias J. Organization of Local Health Area Statistics in New York City.....	350
Gustafson, G. J., and Arnold, Lloyd, M.D. Home Pasteurization of Milk.....	1065
Haines, Blanche M., M.D. Effect of Antepartum Care of the Mother.....	273
Hale, Frank E., Ph.D. Muer's Bacterial Counting Stand.....	653
Hall, Ivan C., Ph.D. An Improved Technic in Burri's Method of Isolating Obligately Anaerobic Bacteria.....	536
Handbook of Physical Education. Ernest G. Schroeder.....	1039
Hardenbergh, John G., V.M.D. Technical Supervision in the Production of Highest Quality Milk.....	705
Harmon, G. E., M.D. Seasonal Distribution of Typhoid Fever—Southern and Northern States.....	395
Harris, Robert S., S.B., and Bunker, John W. M., Ph.D. The Precise Evaluation of Light Therapy in Experimental Rickets.....	1287
Hassler, William C., M.D. Typhoid Fever Epidemic Occurring During the Summer of 1928... ..	137
Hastings, E. G. Inoculating Needles.....	538
Havey, I. Malinde, R.N. What Preparation Should the Public Health Nurse Have for Rural Work?.....	734
Hawaii, Health and Welfare in Honolulu. Frederick E. Trotter, M.D., and Ira V. Hiscock... ..	589
Hayhurst, Emery R., and Rayne, Willmina M. Post-Convention Tour of the A. P. H. A. to Mexico.....	1334
Health and Safety Survey of 25 Leading Department Stores in New York. William Jacobsohn, M.D. ....	277
Health and Welfare in Honolulu, Hawaii. Frederick E. Trotter, M.D., and Ira V. Hiscock... ..	589
Health Conservation Contest, Inter-Chamber. William Butterworth.....	633
Health Contest Awards, The. Editorial.....	641
Health Councils. Editorial.....	519
Health Department, Evolving a. Ennion G. Williams, M.D.....	1293
Health Department Reports, Annual Report of the Sub-Committee of the Committee on Administrative Practice. Charles V. Chapin, Chairman.....	34
Health Education, Established Points in a Community Program of. Henry F. Vaughan, D.P.H. ....	351
Health Officers, The Training of. J. C. Geiger, M.D.....	1055
Health Work, Time, Cooperation and Research Measure Success in. A. J. Chesley, M.D.....	1275
Hedrick, Leonard. Report of Light Typhoid Outbreak in Whittier, California, with Special Reference to the Laboratory Findings.....	425
Herdon, L. Kermit. Stream Pollution in West Virginia.....	204
Heyer, Helen E., and Frankel, Emil. Tuberculous Patients in New Jersey Sanatoriums.....	969
Himebaugh, Lester C., and Pease, Herbert D., M.D. Hygiene of the Towel.....	820
Hiscock, Ira V., and Trotter, Frederick E., M.D. Health and Welfare in Honolulu, Hawaii... ..	589
Hodgson, Violet H., R.N. The Industrial Nurse in Gear with the Machinery for Human Adjustment.....	1323
Hoffman, Frederick L., LL.D. Air Travel and Public Health.....	1129
Hoffman, Frederick L., LL.D. Are the Indians Dying Out?.....	609
Hoffman, Frederick L., LL.D. Discussion of "Need for Cancer Morbidity Statistics" by Francis Carter Wood, M.D.....	19
Home Pasteurization of Milk. Lloyd Arnold, M.D., and C. J. Gustafson.....	1065
Hommon, H. B. Boulder Dam Symposium.....	1086
Honolulu, Hawaii, Health and Welfare in. Frederick E. Trotter, M.D., and Ira V. Hiscock... ..	589
Hospital Facilities for the Treatment of Cancer. Susan M. Wood.....	849
Host City for 1930, The. Ira C. Chase, M.D.....	522
How Much Toxin-Antitoxin is Necessary? Editorial.....	413
How the Nurse Can Help the Health Officer to Get His Message Across. Henry F. Vaughan, D.P.H. ....	930
How to Tell What. Iago Galdston, M.D.....	171

	Page
Huenekens, E. J., M.D. The Well Baby Clinic at the Office of the Family Physician and Pediatrician .....	747
Hull, Thomas G., Ph.D., and Arnold, Lloyd, M.D. The Rôle of the Food Vehicle in Food Poisoning .....	287
Hydrogen Sulphide in Industry—Occurrence, Effects, and Treatment. W. P. Yant.....	598
Hygiene of the Towel. Herbert D. Pease, M.D., and Lester C. Himebaugh.....	820
Ice Cream, Bacteriological Basis for the Effective Pasteurization of. Report of the Committee on Dairy Products and Eggs. J. H. Shrader, Chairman.....	492
Ice Cream, Thermal Death Points of Pathogenic Bacteria in Cream and. Carolyn Oldenbusch, Martin Frobisher, Jr., and J. H. Shrader, M.D.....	615
Illinois Mobile Water and Sewage Laboratory. Anselmo F. Dappert and Harry F. Ferguson .....	80
Illinois, Stream Pollution Control in. H. F. Ferguson.....	201
Improved Drying Plate, An. M. O. Robinson, V.M.D.....	1010
Improved Practical and Economical Methods of Mosquito Control. Report of the Committee on Mosquito Control. Lewis E. Jackson, Chairman.....	628
Improved Technic in Burri's Method of Isolating Obligately Anaerobic Bacteria, An. Ivan C. Hall, Ph.D. ....	536
Incidence of "Jake" Paralysis in Oklahoma, The. David T. Bowden, M.D., L. A. Turley, Ph.D., and H. A. Shoemaker.....	1179
Incidence of Partial Paralysis. E. L. Bishop, M.D., and H. C. Stewart, M.D.....	1307
Increase in Malaria. Editorial.....	185
Incubation of the Completed Kahn Test. Nathan Nagle and John Lazarov.....	1216
Indians Dying Out, Are the? Frederick L. Hoffman, LL.D.....	609
Indol in Bacterial Cultures, Detection of. D. C. B. Duff.....	1012
Industrial Hygiene, Survey Schedule for. Committee on Administrative Practice.....	365
Industrial Methyl Chloride Poisoning. Herman M. Baker, M.D.....	291
Industrial Nurse in Gear with the Machinery for Human Adjustment, The. Violet H. Hodgson, R.N.....	1323
Infant, Effect of Intranatal Care upon the. Walter R. Ramsey, M.D.....	271
Infant, Effect of Prenatal Care upon the. Clifford G. Grulee, M.D.....	269
Influenza and How We May Add to Our Knowledge, What We Know of. Edwin O. Jordan, Ph.D. ....	130
Influenza Epidemic of 1928-1929, with Comparative Data for 1918-1919, The. Selwyn D. Collins, Ph.D. ....	119
Inoculating Needles. E. G. Hastings.....	538
Inter-Chamber Health Conservation Contest. William Butterworth.....	633
Intranatal Care upon the Infant, Effect of. Walter R. Ramsey, M.D.....	271
Irrigation, Sanitary Features of. Jane H. Rider, C.E.....	1187
Jackson, Lewis E., Chairman. Report of the Committee on Mosquito Control.....	628
"Jake" Paralysis in Oklahoma, The Incidence of. David T. Bowden, M.D., L. A. Turley, Ph.D., and H. A. Shoemaker.....	1179
Jacobsohn, William, M.D. Health and Safety Survey of 25 Leading Department Stores in New York.....	277
Jones, D. Breese, Ph.D., and Nelson, E. M., Ph.D. Vitamin Content of Ethylene-treated and Untreated Tomatoes.....	387
Jordan, Edwin O., Ph.D. What We Know of Influenza and How We May Add to Our Knowledge .....	130
Kahn Test, Incubation of the Completed. Nathan Nagle and John Lazarov.....	1216
Kjeldahl Nitrogen without Fume Hood, Electric. W. D. Stovall, M.D., and M. Starr Nichols, Ph.D. ....	772
Kleinschmidt, H. E., M.D. What is a Preventorium?.....	715
Kochler, John P., M.D. Acceptance Address, Inter-Chamber Health Conservation Contest....	635
Kuhlman, Mathilde S., R.N. Public Health Nursing Legislation, What It Should Include.....	408
Lazarov, John, and Nagle, Nathan. Incubation of the Completed Kahn Test.....	1216
Legislation, What It Should Include, Public Health Nursing. Mathilde S. Kuhlman, R.N.....	408
Leonard, George F., M.D. A Convenient Mixing Can for Use in Preparing Diphtheria Toxin-Antitoxin Mixture.....	879
Letters to the Editor. George W. Kosmak, M.D.....	56
C. A. Abele.....	56
Leonard V. Phelps.....	58
J. L. Pomeroy, M.D.....	188
Dr. Felix Tietze.....	189
H. W. Carson.....	190
Liebig, George F., Jr., Tonney, Fred O., M.D., and Greer, Frank E. The Minimal "Chlorine Death Points" of Bacteria.....	503
Lloyd, Bolivar J., M.D. Pan American Sanitary Bureau.....	925
Loomis, H. M., and Cameron, E. J., Ph.D. Bacteriological Control in Commercial Canning....	741
Low Reading Turbidimeter, A. August V. Graf.....	309
Lübeck Affair, The. Editorial.....	1122
Lungs, Effect of Dust on the. Report of the Committee on Silicosis. R. R. Sayers, Chairman .....	368
Manganese in River Water and Its Removal. Perkins Boynton.....	1346
Martin, Agnes J., R.N. The Duties of the Nursing Staff in a Health Department Communicable Disease Service.....	21
Martner, Edgar E., M.D. Convalescent Serum Clinic.....	1343
Maryland, Report of Visits to Local Registrars of Vital Statistics in. John Collinson, M.D., Dr.P.H. ....	839
Massachusetts, 1927-1929, Milk-Borne Disease in. George H. Bigelow, M.D., and Filip C. Forbeck, M.D.....	1091

	Page
McCartney, James L., M.D. Mental Hygiene in a Public Health Program.....	943
McLaughlin, Frederick C. Acceptance Address, Inter-Chamber Health Conservation Contest	637
Mechanical Refrigeration, Difficulties Encountered in the Control of. Joel I. Connolly, Thomas J. Claffy and John J. Aeberly.....	252
Medical Research. Filler.....	491
Menke, H. G., and Decker, A. Clinton. Water Treatment with Chlorinated Copperas.....	357
Mental Hygiene. Editorial.....	838
Mental Hygiene in a Public Health Program. James L. McCartney, M.D.....	943
Menzies, J. Ross. Sanitation of "Pullman Cities" at Shrine Convention.....	1018
Methyl Chloride Poisoning, Industrial. Herman M. Baker, M.D.....	291
Mexican Leadership in Public Health. Editorial.....	978
Mexico City, The Public Health Department in. F. P. Miranda, M.D.....	1125
Meyers, Jerome, M.D. Cancer Death Rates, Smoke and Topography.....	581
Microscope for the Scientist, The DDE—A New Research. R. W. Abell.....	654
Milk, A Bacteriological Study of Grade A Pasteurized. Cecil Brooks.....	1209
Milk-Borne Disease in Massachusetts, 1927-1929. George H. Bigelow, M.D., and Filip C. Forsbeck, M.D.....	1094
Milk, Home Pasteurization of. Lloyd Arnold, M.D., and C. J. Gustafson.....	1005
Milk Laboratories, Mobile. Thomas Parran, Jr., M.D.....	1219
Milk, Significance of Thermophilic Bacteria in Pasteurized. L. A. Rogers, D.Sc., and W. C. Frazier, Ph.D.....	815
Milk, Technical Supervision in the Production of Highest Quality. John G. Hardenbergh, V.M.D. ....	705
Milk, The Use of Sodium Hypochlorites to Preserve. Walter S. Davis.....	308
Milk Treated by Electricity, Preparation of Acidophilus Milk from. E. D. Devereux.....	1009
Minimal "Chlorine Death Points" of Bacteria, The. Fred O. Tonney, M.D., Frank E. Greer, and George F. Liebig, Jr.....	503
Miranda, F. P., M.D. The Public Health Department in Mexico City.....	1125
Mobile Milk Laboratories. Thomas Parran, Jr., M.D.....	1219
Mobile Water and Sewage Laboratory, Illinois. Anselmo F. Dappert and Harry F. Ferguson	80
Monilia Isolated from Sputum, A Study of Cultures of. Ruth Gilbert, M.D., and William M. Groesbeck .....	1
Monroe, John D., M.D., and Volk, V. K., M.D., Dr.P.H. Study of the Effects of 736 Tonsil- lectomies and of 741 Controls.....	495
Montizambert, Dr. Frederick. Obituary.....	187
Morris, Janie F., and Sellers, T. F. The Commintion of Blood Clots for Cultures.....	195
Mother, Effect of Antepartum Care of the. Blanche M. Haines, M.D.....	273
Mouth Spray and Puerperal Fever. Editorial.....	982
Mudge, C. S. A Storage Bin for Laboratory Glassware.....	1141
Mudge, C. S. Convenient Platinum Needle.....	195
Muer's Bacterial Counting Stand. Frank E. Hale, Ph.D.....	653
Municipal Sanitation. A New Journal. Editorial.....	300
Mustiness in Eggs, The Cause of. M. P. Spanswick.....	73
Nagle, Nathan, and Lazarov, John. Incubation of the Completed Kahn Test.....	1216
National Movement for Cleaner Cities. Editorial.....	296
Need for Cancer Morbidity Statistics. Francis Carter Wood, M.D.....	11
Nelson, E. M., Ph.D., and Jones, D. Breese, Ph.D. Vitamin Content of Ethylene-treated and Untreated Tomatoes.....	387
New Jersey Sanatoriums, Tuberculous Patients in. Emil Frankel and Helen E. Heyer.....	969
News from the Field:	
Adler, Dr. Herman, Goes to California.....	692
Albert, Death of Henry.....	579
American Editors' and Authors' Association.....	1177
American Journal of Clinical Pathology.....	1387
A. N. A. Birthday.....	1389
Argentina Establishes a "Model Institute of Maternal and Child Hygiene".....	1272
Arizona Public Health Association Meeting.....	347
Austrian Health Demonstrations.....	241
Bi-Co-Li .....	1177
Bovine T. B. Declines.....	1053
Burke Foundation, The.....	1176
Canadian People Valued at \$175,000,000,000.....	811
Cancer Research Fund.....	348
Capper Award to Dr. Babcock.....	1053
Channing. Child Hospital Opened in Vienna.....	239
Children's Bureaus, Germany.....	238
Child Labor Day.....	1388
Child Study Association.....	1176
Child Welfare Measures in Italy.....	348
Cleveland Academy of Medicine.....	811
Clinic for Mental and Nervous Diseases of Children.....	115
Coffee Seldom Found to Violate Food Law.....	1054
Colorado Post-Graduate Course in Psychiatry.....	692
Congress for Sex Research.....	239
Connecticut Division of Mental Hygiene.....	340
Cost of Medical Care under Sickness Insurance in Germany.....	349
County Health Departments for Michigan.....	116
Delta Omega .....	579



	Page
Delta Omega New Officers.....	1388
Denmark's Delicate Children.....	116
Dick Patent Held Valid by Federal Court.....	1054
Dinwiddie, Mr., in New York Health Department.....	579
Eighth Texas Sanitarians Short School.....	1033
Federal Bureau is Organizing to Enforce Produce Licensing Law.....	922
Fellowship in Chemical Research.....	1177
Fellowships in Medicine.....	813
First International Congress on Mental Hygiene, The.....	240
Flight Doctors' Course.....	1177
Florida Short Courses in Water and Sewage Treatment.....	693
Gloversville Philanthropist Donates Funds for Public Health Work.....	921
Government Hospitals in Need of Medical Officers, Nurses and Social Workers.....	1388
Hard of Hearing Conference.....	694
Health Library of the City Hall, The.....	813
Health Test for Cooks Decried by Law in Cuba.....	115
Holyoke, Mass.....	117
Hong Kong Seeks to Stop the Selling of Girl Children.....	347
Hospital Association Meeting in New Orleans.....	811
Infant Mortality Rate Highest in Washington.....	811
International Association of Milk Dealers.....	812
International Association for the Prevention of Blindness.....	1387
International Association of Dairy and Milk Inspectors.....	1389
International Association of Milk Dealers Convention.....	1387
Kentucky.....	578
Mason, Max, New Rockefeller President.....	115
Massachusetts Institute of Technology.....	692
Maternity and Child Welfare.....	813
Measures for Increase of Population.....	116
Meeting of International Association of Dairy and Milk Inspectors.....	116
Mental Hygiene in Argentina.....	692
Mental Hygiene Institute.....	1177
Mental Hygiene Meeting at Norwich, Conn.....	116
Mental Hygiene Speakers.....	467
Metropolitan Area Food and Health Officials Form New Association.....	465
Mexican Baby Stamps.....	115
Mexicans and Public Health.....	467
Michigan Conference.....	1176
Michigan Public Health Association.....	465
Milk and Cream Contests.....	466
Missouri Public Health Association.....	694
Missouri Water and Sewage Conference.....	1387
Motor Fatalities.....	1273
Motion Pictures for Lepers.....	117
Named on White House Committee.....	921
National Committee for Mental Hygiene Offers Fellowships.....	1387
National Leprosarium at Carville.....	921
Negro Nurses.....	115
Negro Public Health Nursing.....	1388
New Foundation, A.....	813
New Jersey Industrial Nurses.....	812
New Jersey Nurses to Meet.....	467
New Jersey Public Health and Sanitary Association.....	238
New Laboratory Car.....	694, 812
New Method of Milk Production.....	1389
New Mexico.....	241
New Mexico Public Health Association.....	922
New York Society for the Experimental Study of Education.....	1387
New York State Public Health Commission.....	693, 921
New York State Sewage Works Association.....	1176
Nicoll, Dr., Honorary Life Member of State and Provincial Health Authorities.....	349
Nicoll, Matthias, Jr., M.D., New York Health Commissioner, Resigns to Become County Health Officer.....	346
Nobel Prize in Medicine.....	240
Northern California Public Health Association.....	466
Nurses' Grading Studies.....	1272
Nursing Calendar.....	1272
Parran, Dr., New York Commissioner of Health.....	465
Parrot Has Health Certificate.....	1273
Peters, Lulu Hunt, Dies.....	922
Philippine University Receives \$150,000 Gift.....	811
Pink Bollworm Stopped.....	1054
Popular Science Monthly Prize.....	240
Prevention of Blindness Conference.....	1389
Prize Offered to Italian Physicians.....	349
Ravenel Award in Public Health, The.....	347
Recreation Parks.....	1053
Rent Allowances for Children, Great Britain.....	348
Research Fellowships.....	578, 1053

	Page
Rider, Jane H.....	923
Rocky Mountain Spotted Fever.....	1177
Roentgen Pioneer.....	1272
Safety Broadcasting.....	693
Sanitary Supervision of Canneries.....	693
Sanitary Survey of Texas Storm Area.....	1054
Scarlet Fever Case.....	812
Scientific Expedition into Borneo.....	579
Smallpox Practically Extinct in Bulgaria and Hungary.....	922
Southern California Public Health Association.....	1178
Southern Social Hygiene Institute.....	466
Standard Safety Code.....	694
Standardization of Term "Blindness".....	115
Standards for Maternity Care.....	348
Stevenson, William L.....	1272
Summer School Courses in Public Health.....	922
Sweden to Get New Dental Clinic.....	576
Texas Association of Sanitarians.....	1388
Texas Public Health Association.....	239
Texas Tuberculosis Association.....	1176
Texas Water Works Short School.....	921
31,500 Killed by Motors in 31 States in 1929.....	465
Tokio's Hospital.....	348
University of Florida.....	692
University of Southern California.....	578
Utica's Most Useful Citizen for 1929.....	922, 1053
Vaccine to Cure Colds.....	466
Vienna's "Mutterschulen".....	922
Virginia Public Health Association.....	692
Warsaw Has New Hospital.....	116, 347
Welch, Dr. William Henry, Honored.....	115
West Virginia Nurses.....	579
West Virginia Public Health Association.....	1272
White, George Robert, Fund.....	238
White, W. B., to Head U. S. Food Control Office.....	1178
Wiley, Harvey W., Resigns.....	693
Wisconsin Medical Society.....	239
Yale School of Medicine.....	1272
New Use for the Malarial Parasite. Editorial.....	465
New York City, Organization of Local Health Area Statistics in. Godias J. Drolet and William H. Guilfooy, M.D.....	51
New York, Health and Safety Survey of 25 Leading Department Stores. William Jacobsohn, M.D. ....	380
Nichols, M. Starr, Ph.D., and Stovall, W. D., M.D. Electric Kjeldahl Nitrogen without Fume Hood .....	277
Noise, What Is the Saturation Point for City? Editorial.....	772
Norton, John F., Ph.D. The Administrative Significance of Proposed Changes in Standard Methods of Water Analysis.....	758
Norton, John F., Secretary. Minutes of the Meeting of the Committee on Standard Methods of the Laboratory Section.....	27
Nurse Can Help the Health Officer to Get His Message Across, How the. Henry F. Vaughan, D.P.H. ....	74
Nurse for Social Phases of Her Work, Responsibility of the Public Health. Katharine Faville, R.N.....	930
Nurse Have for Rural Work, What Preparation Should the Public Health? I. Malinde Havey, R.N. ....	165
Nurse, Her Standing Orders for First Aid, and Her School Nursing Procedure, First Aid Cabinet of a School. Charles Christopher Wilson, M.D.....	734
Nurse in Gear with the Machinery for Human Adjustment, The Industrial. Violet H. Hodgson, R.N.....	147
Ogilvie, J. A. A Peep into West Indian Medical History.....	1323
Oklahoma, The Incidence of "Jake" Paralysis in. David T. Bowden, M.D., L. A. Turley, Ph.D., and H. A. Shoemaker.....	1207
Oldenbusch, Carolyn, Frobisher, Martin, Jr., and Shrader, J. H., M.D. Thermal Death Points of Pathogenic Bacteria in Cream and Ice Cream.....	1179
Organization of Local Health Area Statistics in New York City. Godias J. Drolet and William H. Guilfooy, M.D.....	615
Owen, Helen H., and Band, Marie. The Stoltenberg Differential Stain for Diphtheria Bacilli	380
Pan American Sanitary Bureau. Bolivar J. Lloyd, M.D.....	426
Paralysis, Incidence of Partial. E. L. Bishop, M.D., and H. C. Stewart, M.D.....	925
Paralysis in Oklahoma, The Incidence of "Jake." David T. Bowden, M.D., L. A. Turley, Ph.D., and H. A. Shoemaker.....	1307
Park, William H., M.D. Value of the Newly Identified Types in the Study of the Epidemiology of Pneumococcus Infections.....	1179
Parran, Thomas, Jr., M.D. Mobile Milk Laboratories.....	403
Pasteurization, An Effective and Practical Definition of. Leslie C. Frank, C.E.....	1219
Pasteurization of Ice Cream, Bacteriological Basis for the Effective. Report of the Committee on Dairy Products and Eggs. J. H. Shrader, Chairman.....	1105
	492

	Page
Pasteurization of Milk, Home. Lloyd Arnold, M.D., and C. J. Gustafson.....	1065
Pasteurized Dried Fruits. Carl R. Fellers, Ph.D.....	175
Pasteurized Milk, A Bacteriological Study of Grade A. Cecil Brooks.....	1209
Pasteurized Milk, Significance of Thermophilic Bacteria in. L. A. Rogers, D.Sc., and W. C. Frazier, Ph.D.....	815
Pasteurizing Plants, The Control of Thermophilic Bacteria in. M. W. Yale and Robert S. Breed, Ph.D.....	1192
Pease, Herbert D., M.D., and Himebaugh, Lester C. Hygiene of the Towel.....	820
Peep into West Indian Medical History, A. J. A. Ogilvie.....	1207
Physical Measurements of One Thousand Smith College Students. Faith Fairfield Gordon, M.D. ....	963
Platinum Needle, Convenient. C. S. Mudge.....	195
Pneumococcus Infections, Value of the Newly Identified Types in the Study of the Epidemiology of. William H. Park, M.D.....	403
Polioomyelitis and What They Suggest, Seasonal and Age Studies of. W. Lloyd Aycock.....	41
Pollution Control in Illinois, Stream. H. F. Ferguson.....	201
Pollution in West Virginia, Stream. L. Kermit Herndon.....	204
Pollution Program in Virginia, Stream. A. Wagner.....	202
Practical Aspects Concerned with Securing Enforcement of Suggested Definition for Pasteurization. George W. Grim, V.M.D.....	1110
Precise Evaluation of Light Therapy in Experimental Rickets, The. John W. M. Bunker, Ph.D., and Robert S. Harris, S.B.....	1287
Pre-disaster Preparedness, Report of the Committee on Disaster Relief. E. L. Filby, Chairman	469
Preliminary Program of the Fifty-ninth Annual Meeting American Public Health Association	984
Prenatal Care upon the Infant, Effect of. Clifford G. Grulee, M.D.....	269
Preparation of Acidophilus Milk from Milk Treated by Electricity. E. D. Devereux.....	1009
Preschool Child, Free Clinics for the. Shirley W. Wynne, M.D., Dr.P.H.....	263
Presidential Address, A. J. Chesley, M.D. Time, Cooperation and Research Measure Success in Health Work.....	1275
Preventorium, What is a? H. E. Kleinschmidt, M.D.....	715
Problems in Public Health Administration. George C. Ruhland, M.D.....	833
Problems of Cancer Mortality Statistics. H. E. Robertson, M.D.....	257
Progress on Federal Health Correlation. Editorial.....	638
Progress Report of Pulaski, Virginia, Reservoir Studies. F. J. Sette.....	1147
Psittacosis. Editorial .....	756
Psittacosis. Filler .....	1218
Public Health and Medical Problems in Disasters. William DeKleine, M.D.....	479
Public Health Nursing Legislation, What It Should Include. Mathilde S. Kuhlman, R.N.....	408
Public Health Nurse Have for Rural Work, What Preparation Should the? I. Malinde Havey, R.N. ....	734
Public Health Department in Mexico City, The. F. P. Miranda, M.D.....	1125
Pulaski, Virginia, Reservoir Studies, Progress Report of. F. J. Sette.....	1147
Pulmonary Tuberculosis in Students. Lee H. Ferguson, M.D.....	955
Ramsey, Walter R., M.D. Effect of Intranatal Care upon the Infant.....	271
Rapid Method for Pipetting Broth in Measured Amounts, A. G. D. Cummings.....	72
Rapid Method of Using the Sabin Slide Microscopic Test for Determining the Types of Pneumococci. Jesse G. M. Bullock, M.D., and Audrey H. Schuman.....	878
Rayne, Williamina M., and Hayhurst, Emery R. Post-Convention Tour of the A. P. H. A. to Mexico .....	1334
Records, Some Difficulties in the Collection of. Stewart G. Thompson, D.P.H.....	161
Refrigeration, Difficulties Encountered in the Control of Mechanical. Joel I. Connolly, Thomas J. Claffy and John J. Aeberly.....	252
Refuse Collection and Disposal, The Sanitary Aspects of. Report of the Committee on Refuse Collection and Disposal. Kenneth Allen, Chairman.....	509
Reports of Committees:	
Annual Health Department Reports. C. V. Chapin, Chairman.....	34
Anthrax. Henry Field Smyth, Chairman.....	155
Bathing Places. Joint Report with Conference of State Sanitary Engineers. Stephen DeM. Gage, Chairman.....	7
Dairy Products and Eggs. J. H. Shrader, Chairman.....	492
Disaster Relief. E. L. Filby, Chairman.....	469
Mosquito Control. Lewis E. Jackson, Chairman.....	628
Refuse Collection and Disposal. Kenneth Allen, Chairman.....	509
Rural Sanitation. V. M. Ehlers, Chairman.....	619
Silicosis. R. R. Sayers, Chairman.....	368
Standardization of the Wassermann Test. Ruth Gilbert, Referee (Abstract).....	47
Standard Methods of the Laboratory Section, Minutes. John F. Norton, Secretary.....	74
Training and Personnel. C. E. Turner, Chairman.....	855
Water Supply. John R. Baylis, Chairman.....	485
Waterways Pollution. W. L. Stevenson, Chairman.....	751
Report of Light Typhoid Outbreak in Whittier, California, with Special Reference to the Laboratory Findings. Leonard Heddick.....	425
Report of Visits to Local Registrars of Vital Statistics in Maryland. John Collinson, M.D., Dr.P.H. ....	839
Respiratory Diseases and Disability. Editorial.....	299
Responsibility of the Public Health Nurse for the Social Phases of Her Work. Katherine Faville, R.N.....	165
Reynolds, Leon B. Boulder Dam Symposium.....	1071
Rickets, The Precise Evaluation of Light Therapy in Experimental. John W. M. Bunker, Ph.D., and Robert S. Harris, S.B.....	1287

	Page
Rider, Jane H., C.E. Sanitary Features of Irrigation.....	1187
Robertson, H. E., M.D. Problems of Cancer Mortality Statistics.....	257
Robinson, M. O., V.M.D. An Aid to More Accurate Colony Counting.....	1232
Robinson, M. O., V.M.D. An Improved Drying Plate.....	1010
Rogers, L. A., D.Sc., and Frazier, W. C., Ph.D. Significance of Thermophilic Bacteria in Pasteurized Milk.....	815
Role of the Food Vehicle in Food Poisoning, The. Thomas G. Hull, Ph.D., and Lloyd Arnold, M.D. ....	287
Ruhland, George C., M.D. Problems in Public Health Administration.....	833
Rural Work, What Preparation Should the Public Health Nurse Have for? I. Malinde Havey, R.N. ....	734
Sabin Slide Microscopic Test for Determining the Types of Pneumococci, A Rapid Method of Using the. Jesse G. M. Bullova, M.D., and Audrey H. Schuman.....	878
Sanitary Aspects of Refuse Collection and Disposal, The. Report of the Committee on Refuse Collection and Disposal. Kenneth Allen, Chairman.....	509
Sanitary Features of Irrigation. Jane H. Rider, C.E.....	1187
Sanitation of "Pullman Cities" at Shrine Convention. J. Ross Menzies.....	1018
Sayers, R. R., Chairman. Effect of Dust on the Lungs, Report of the Committee on Silicosis.....	368
School Hygiene, Sickness Records in. Jean Downes.....	1199
School Nurse, Her Standing Orders for First Aid, and Her School Nursing Procedure, First Aid Cabinet of a. Charles Christopher Wilson, M.D.....	147
Schultz, E. W., M.D., and Banham, F. D. Description of a New Mechanical Disintegrator....	771
Schuman, Audrey H., and Bullova, Jesse G. M., M.D. A Rapid Method of Using the Sabin Slide Microscopic Test for Determining the Types of Pneumococci.....	878
Seasonal and Age Studies of Poliomyelitis and What They Suggest. W. Lloyd Aycock.....	41
Seasonal Distribution of Typhoid Fever—Southern and Northern States. G. E. Harmon, M.D.....	395
Sellers, T. F., and Morris, Janie F. The Communion of Blood Clots for Cultures.....	195
Serum Treatment of Meningitis. Editorial.....	518
Sette, F. J. Progress Report of Pulaski, Virginia, Reservoir Studies.....	1147
Sewage and Conservation. Editorial.....	520
Ship Doctor and Public Health, The. Editorial.....	981
Shoemaker, H. A., Bowden, David T., M.D., and Turley, L. A., Ph.D. The Incidence of "Jake" Paralysis in Oklahoma.....	1179
Should Certified Milk be Pasteurized? Editorial.....	183
Shrader, J. H., Chairman. Bacteriological Basis for the Effective Pasteurization of Ice Cream. Report of the Committee on Dairy Products and Eggs.....	492
Shrader, J. H., M.D., Oldenbusch, Carolyn, and Frobisher, Martin, Jr. Thermal Death Points of Pathogenic Bacteria in Cream and Ice Cream.....	615
Sickness Records in School Hygiene. Jean Downes.....	1199
Significance of Thermophilic Bacteria in Pasteurized Milk. L. A. Rogers, D.Sc., and W. C. Frazier, Ph.D.....	815
Simple Method for Indicating the Various Sugars Used in the Carbohydrate Series, A. R. V. Stone, D.V.M.....	1140
Smith College Students, Physical Measurements of One Thousand. Faith Fairfield Gordon, M.D. ....	963
Smoke and Topography, Cancer Death Rates. Jerome Meyers, M.D.....	581
Smyth, Henry Field, Chairman. Anthrax as an Occupational Disease. Report of the Committee .....	155
Sodium Hypochlorites to Preserve Milk, The Use of. Walter S. Davis.....	308
Some Difficulties in the Collection of Records. Stewart G. Thompson, D.P.H.....	161
Some Special Problems in Atmospheric Pollution. Abel Wolman.....	243
Spanwick, M. P. The Cause of Mustiness in Eggs.....	73
Sputum, A Study of Cultures of Monilia Isolated from. Ruth Gilbert, M.D., and William M. Groesbeck .....	1
Standardization of the Wassermann Test. Report of the Committee. Abstract. Ruth Gilbert, M.D., Referee.....	47
Standard Methods of the Laboratory Section, Minutes of the Meeting of the Committee on. John F. Norton.....	74
Standard Methods of Water Analysis, The Administrative Significance of Proposed Changes in. John F. Norton, Ph.D.....	27
Standards for Public Bathing Beaches and Wading Pools. Report of the Committee. Stephen DeM. Gage, Chairman.....	7
Sterile Dispensing Funnel, A. G. D. Cummings.....	1231
Stevenson, W. L., Chairman. Report of the Committee on Waterways Pollution.....	751
Stewart, H. C., M.D., and Bishop, E. L., M.D. Incidence of Partial Paralysis.....	1307
Stoltenberg Differential Stain for Diphtheria Bacilli, The. Helen H. Owen and Marie Band....	426
Stone, R. V., D.V.M. A Simple Method for Indicating the Various Sugars Used in the Carbohydrate Series.....	1140
Storage Bin for Laboratory Glassware, A. C. S. Mudge.....	1141
Stovall, W. D., M.D., and Nichols, M. Starr, Ph.D. Electric Kjeldahl Nitrogen without Fume Hood .....	772
Stream Pollution Control in Illinois. H. F. Ferguson.....	201
Stream Pollution in West Virginia. L. Kermit Herndon.....	204
Stream Pollution Program in Virginia. A. Wagner.....	202
Streptococci, Tonsils and Rheumatism. Editorial.....	297
Stroud, R. J., M.D. Discussion of Boulder Dam Symposium.....	1092
Students, Pulmonary Tuberculosis in. Lee H. Ferguson, M.D.....	955

	Page
Study of Cultures of Monilia Isolated from Sputum, A. Ruth Gilbert, M.D., and William M. Groesbeck .....	1
Study of the Effects of 736 Tonsillectomies and of 741 Controls. John D. Monroe, M.D., and V. K. Volk, M.D., Dr.P.H.....	495
Summer Recreation, Health Aspects of. Charles F. Dalton, M.D.....	697
Survey Schedule for Industrial Hygiene, A. Committee on Administrative Practice.....	365
Swimming Pool Standards in Detroit, Administration of. William H. Cary, Jr.....	727
Technical Supervision in the Production of Highest Quality Milk. John G. Hardenbergh, V.M.D. ....	705
Terrell, Dr. Truman. Real Western Entertainment at Fort Worth Convention.....	1128
Therapy in Experimental Rickets, The Precise Evaluation of Light. John W. M. Bunker, Ph.D., and Robert S. Harris, S.B.....	1287
Thermal Death Points of Pathogenic Bacteria in Cream and Ice Cream. Carolyn Oldenbusch, Martin Frobisher, Jr., and J. H. Shrader, M.D.....	615
Thermophilic Bacteria in Pasteurized Milk, Significance of. L. A. Rogers, D.Sc., and W. C. Frazier, Ph.D.....	815
Thermophilic Bacteria in Pasteurizing Plants, The Control of. M. W. Yale and Robert S. Breed, Ph.D.....	1192
Thompson, Stewart G., D.P.H. Some Difficulties in the Collection of Records.....	161
Time, Cooperation and Research Measure Success in Health Work. A. J. Chesley, M.D.....	1275
Tomatoes, Vitamin Content of Ethylene-treated and Untreated. D. Breese Jones, Ph.D., and E. M. Nelson, Ph.D.....	387
Tongue Blade, Shall We Eliminate the Use of the? Filler.....	740
Tonney, Fred O., M.D., Greer, Frank E., and Liebig, George F., Jr. The Minimal "Chlorine Death Points" of Bacteria.....	503
Tonsillectomies and of 741 Controls, Study of the Effects of 736. John D. Monroe, M.D., and V. K. Volk, M.D., Dr.P.H.....	495
Towel, Hygiene of the. Herbert D. Pease, M.D., and Lester C. Himebaugh.....	820
Training and Personnel. Report of the Committee. C. E. Turner, Chairman.....	855
Training of Health Officers, The. J. C. Geiger, M.D.....	1055
Traum, J. Animal Infections with Bacteria of Genus Brucella and Their Relation to Undulant Fever of Man.....	935
Trembles or "Milk Sickness" Reported Rare Among Humans. Filler.....	262
Trotter, Frederick E., M.D., and Hiscock, Ira V. Health and Welfare in Honolulu, Hawaii	589
Tuberculosis in Students, Pulmonary. Lee H. Ferguson, M.D.....	955
Tuberculous Patients in New Jersey Sanatoriums. Emil Frankel and Helen E. Heyer.....	969
Turbidimeter, A Low Reading. August V. Graf.....	309
Turley, L. A., Ph.D., Shoemaker, H. A., and Bowden, David T., M.D. The Incidence of "Jake" Paralysis in Oklahoma.....	1179
Turner, C. E., Chairman. Report of the Committee on Training and Personnel.....	855
Typhoid Fever Epidemic in the Far North, A. F. M. Brickenden.....	543
Typhoid Fever Epidemic Occurring During the Summer of 1928. William C. Hassler, M.D...	137
Typhoid Fever—Southern and Northern States, Seasonal Distribution of. G. E. Harmon, M.D.	395
Typhoid Outbreak in Whittier, California, with Special Reference to the Laboratory Findings, Report of Light. Leonard Heddiak.....	425
Undulant Fever, Agglutination Tests for the Diagnosis of. S. Bayne-Jones, M.D.....	1313
Undulant Fever Germs Hard to Kill. Filler.....	160
Undulant Fever of Man, Animal Infections with Bacteria of Genus Brucella and Their Relation to. J. Traum.....	935
Use of Irradiated Foods, The. Editorial.....	182
Use of Sodium Hypochlorites to Preserve Milk, The. Walter S. Davis.....	308
Vaccine and Vaccination. Editorial.....	1224
Value of the Newly Identified Types in the Study of the Epidemiology of Pneumococcus Infections. William H. Park, M.D.....	403
Vaughan, Henry F., D.P.H. How the Nurse Can Help the Health Officer to Get His Message Across .....	930
Vaughan, Henry F., D.P.H. Established Points in a Community Program of Health Education .....	351
Vaughan, Victor Clarence, Death of. Obituary.....	53
Ventilation and Comfort. Editorial.....	49
Virginia, Stream Pollution Program in. A. Wagner.....	202
Vitamin Content of Ethylene-treated and Untreated Tomatoes. D. Breese Jones, Ph.D., and E. M. Nelson, Ph.D.....	387
Vital Statistics in Maryland, Report of Visits to Local Registrars of. John Collinson, M.D., Dr.P.H. ....	839
Volk, V. K., M.D., Dr.P.H., and Monroe, John D., M.D...Study of the Effects of 736 Tonsillectomies and of 741 Controls.....	495
Wagner, A. Stream Pollution Program in Virginia.....	202
Wallace, James, M.D. Care of Communicable Diseases in General Hospitals.....	722
Wassermann Test, Standardization of the. Report of the Committee. Abstract. Ruth Gilbert, M.D., Referee.....	47
Water Analysis, The Administrative Significance of Proposed Changes in Standard Methods of. John F. Norton, Ph.D.....	27
Water Treatment with Chlorinated Copperas. A. Clinton Decker and H. G. Menke.....	357
Waterways Pollution. Report of the Committee. W. L. Stevenson, Chairman.....	751
Well Baby Clinic at the Office of the Family Physician and Pediatrician, The. E. J. Huenekens, M.D.....	747

	Page
West Indian Medical History, A Peep into. J. A. Ogilvie.....	1207
West Virginia Nurses. News from the Field.....	1272
West Virginia, Stream Pollution in. L. Kermit Herndon.....	262
What is a Preventorium? H. E. Kleinschmidt, M.D.....	15
What Preparation Should the Public Health Nurse Have for Rural Work? I. Malinde Havey, R.N.....	734
What We Know of Influenza and How We May Add to Our Knowledge. Edwin O. Jordan, Ph.D. ....	130
Whittier, California, with Special Reference to the Laboratory Findings, Report of Light Typhoid Outbreak in. Leonard Heddick.....	425
Williams, Ennion G., M.D. Evolving a Health Department.....	1293
Wilson, Charles Christopher, M.D. First Aid Cabinet of a School Nurse, Her Standing Orders for First Aid, and Her School Nursing Procedure.....	147
Wolman, Abel. Some Special Problems in Atmospheric Pollution.....	243
Wood, Francis Carter, M.D. Need for Cancer Morbidity Statistics.....	11
Wood, Susan M. Hospital Facilities for the Treatment of Cancer.....	849
Wynne, Shirley W., M.D., Dr.P.H. Free Clinics for the Preschool Child.....	263
X-Rays and the Public Health. Editorial.....	185
Yale, M. W., and Breed, Robert S., Ph.D. The Control of Thermophilic Bacteria in Pas- teurizing Plants.....	1192
Yant, W. P. Hydrogen Sulphide in Industry—Occurrence, Effects, and Treatment.....	598



nic described in attempting to confirm or deny results obtained.

These authors took advantage of the opportunity to insist again on the necessity for using naturally susceptible individuals in studies on infectiousness of a given organism and in immunity studies. They further point out a very marked difference between cholera vibrios freshly isolated from the host and organisms that have been long under artificial cultivation. In therapeutic work the use of bacteriophage reduced the mortality from 62.9 per cent to 8.1 per cent. The chapters on epidemiology and on general and specific prophylaxis are particularly interesting from the standpoint of public health.

The most obvious conclusion that can be drawn from this work is that it should be confirmed. There has already been an effort to repeat this work although on a much smaller scale and in another country. The results have been entirely contradictory. It should be mentioned that this work was undertaken by a member of the Pasteur Institute, and it is well known that many of the outstanding members of the staff of this institute are violently opposed to d'Herelle and his work. It is, of course, impossible to state which of the two results are acceptable. The significance of this work is sufficiently great to warrant its further investigation by someone familiar with the technic of bacteriophage but not allied definitely with the supporters of d'Herelle or his active opponents.

N. W. LARKUM

**Sanitation, Hygiene, Bacteriology and Sterilization—***By Herman Goodman, B.S., M.D. New York: Medical Lay Press, 1929. 191 pp. Price, \$3.50.*

This little book is one of the Cosmetic Handbook Series intended for the instruction of those known as "cosmetologists."

The author makes a plea for clean

shops which we can endorse. The title shows that the author has attempted to cover a wide field. While we do not, in general, approve of books which give only a smattering of a subject, it must be admitted that the present one is correct as far as it goes, and, for the class of readers for whom it is intended, gives a considerable amount of very useful advice, which, if followed, will improve the profession.

M. P. RAVENEL

**An Index to the Chemical Action of Microorganisms on the Non-Nitrogenous Organic Compounds—***By Ellis I. Fulmer, Ph.D., and C. H. Werkman, Ph.D. Springfield, Ill.: Charles C. Thomas, 1930. Price, \$4.50.*

The tables which form the contents of this book will be welcomed by those who are interested in the chemical changes produced by the activity of a great variety of microorganisms in non-nitrogenous substances.

Table 1 enables the reader to gain knowledge as to the general chemical action of a given organism. Table 2 is arranged so as to give information of the various products elaborated from a given substrate by the organism involved. Table 3 lists the types of substrates from which a given chemical has been reported as produced by the named organism.

A list of references is given which is more representative of the recent work. A few errors have crept in: Bio-chem. Z. 174 as of 1906, instead of 1926; Tuikow, instead of Tiukow; Iwatsuru, Rynzo instead of Ryuzo.

The arrangement of the tables is excellent. Their spacing will permit supplementing the given data by personal notes. The authors have purposely limited their material, emphasizing the data concerning the less common types of fermentation, but have included typical references to the common types.

ESTHER W. STEARN



**History of Nursing and Sociology—**  
*Compiled by A Sister of Charity of*  
*Emmitsburg, Md. Bridgeport:*  
*Brewer-Colgan Co., 1929. 279 pp.*  
 Price, \$3.00.

This book could be called "A History of Catholic Nursing and Sociology," and if we accept the author's statement, that the extent of the service of the Catholic Church as a health agency in the United States ranks it in the first place among health forces not supported by public tax, we need to see public health and nursing more through Catholic eyes.

The author has tried to present briefly the important points in the history of nursing which every student nurse and graduate nurse should know. She goes back to the beginning of the history of medicine, shows the influence Christianity had on medical development, and then traces the history of hospitals, before she comes to the origin of nursing.

It is interesting to learn that there are about 30 Catholic orders doing nursing. The Sisters of Charity alone have 200 hospitals. There are in the United States nearly 400 Catholic schools of nursing which are fully accredited.

There are chapters on Organized Catholic Charities, and World War Contributions of American Catholics, though it is a bit difficult to see where nursing ties up with some of the material given here.

There is a long chapter on organizations affiliated with nursing and the contributions they are making to it. The author fails to show clearly how nursing ties up with the National Tuberculosis Association and the American Social Hygiene Association.

The second part of the book deals with sociology from a Catholic point of view and was contributed by Frederick J. Russel, C.M., S.T.D. Here the four chapters deal with Sociology, Hypnotism, Evolution, and Spiritism.

The material in the whole book ap-

pears to be put together in the form of a memorandum, and since there is little order in the arrangement, the lack of an index is perhaps a serious fault, though the author doubtless felt a full table of contents would serve as well. The paragraphs in the first part are brief and concise, but later on there is rather a tiresome amount of detail given in the descriptions of the organizations. There are frequent repetitions, and a great many typographical errors.

There is some new material here but not enough to draw the majority of nurses away from one or two other well known histories of nursing which contain all that nurses need to know of this subject in a much more readable form.

EVA F. MACDOUGALL

**The Social Worker in Family, Medical, and Psychiatric Social Work**  
*—By Louise C. Odencrantz. New*  
*York: Harper, 1929. 374 pp. Price,*  
 \$2.50.

Modern social work practices, methods and technics are described in this book in a manner to make it particularly valuable to executives and to those interested in the comparative study and analysis of professional standards. The American Association of Social Workers presents a job analysis study of positions in three fields to which the case work method is common—family, medical, and psychiatric social work.

The first medical social worker began her duties in a hospital in 1905. Present estimates give the number of hospitals and clinics in the United States which have social service departments at about 500, and these include over 1,500 workers.

To make the doctor's work worth while to himself and to the patient, it must be done (in hospitals) in coöperation with someone who has time and ability to teach hygiene and to see that it is carried out, to study the home conditions and report upon their part in causing or prolonging disease, and to help modify those conditions, financial, mental, moral,

which stand between the patient and recovery. This "someone" is the social worker—a man or woman trained to think of a human being as a whole just as naturally as the physician concentrates attention upon a part—(Cabot).

There are some 400 psychiatric social workers in the United States. The psychiatric social worker is defined as a social case worker who has had systematic instruction in the psychological factors underlying behavior and in the principles of physical and mental disease and their social aspects, and training in dealing with psychiatric cases.

In gathering the material for this book, the author consulted executives, supervisors, and staff members, workers "on the job," case records, annual reports, and studies. Public health as well as social workers and hospital administrators will find this an authentic source of valuable information regarding a relatively new profession.

IRA V. HISCOCK

**Symposium on Physical Education and Health—Compiled and edited by Jay B. Nash, Emma R. Frazier, and Marguerite Vollmer. New York: New York University Press, 1930. 320 pp. Price, \$2.00.**

This publication assembles the papers presented in connection with the dedication of the new building for education in the School of Education, New York University, by 29 contributors.

The book is ". . . dedicated to Clark W. Hetherington whose philosophy has been the inspiration for many of these articles." This is a merited recognition of the fundamental service that Hetherington has given in the organization and development of physical education in New York University. It does not diminish in the least the high value of these papers to call attention to the fact

that their record of Hetherington's contributions to modern thought in physical education is immensely greater than the quotation marks in this symposium indicate. His influence on the science and philosophy of physical education is, and for some years has been, greater than that of any other student in the field of education. His students and auditors have spread his progressive views universally so that they are now largely common property; stressed by authors and teachers, but unrecognized as products of his mind.

THOMAS A. STOREY

**Insomnia. How to Combat It—By Joseph Collins, M.D. New York: Appleton, 1930. 131 pp. Price, \$1.50.**

Apparently as an interlude in his literary musings on more ponderous subjects, the doctor who has looked at love and life, at literature, and at nearly everything else that editors want, has produced a slim volume on sleep and its cultivation. In it he reveals most of the medical recipes for the treatment and cure of insomnia, with some cursory discussion of dreams, drugs, and diet.

The book is written in an interesting manner, even if it is padded and somewhat repetitious, and the information is eminently practical, even if the customary emphasis is placed on cure rather than on the prevention of the underlying causes of the defects discussed. Thus, much is said about indigestion in relation to insomnia, and something is said about the quantity of food consumed, but there is practically nothing about the quality of nutrition, which is one of the really essential factors in physical welfare. There is an interesting chapter on reading as a soporific. Perusal of this book ought to be quite conducive to sleep. JAMES A. TOBEY

# HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

**Milwaukee, Wis.**—In the *Bulletin* of the Milwaukee Health Department for February, 1930, is found an excellent summary of the city's health during 1929. Conditions on the whole were satisfactory, notwithstanding the largest influenza epidemic since 1918, and a measles epidemic. The general death rate was 10.5 compared with 10.9 for 1928. The infant mortality rate was 72 per 1,000 births, a slight increase over previous years, partly due to increased hospital facilities which draw ill babies from outlying districts. There occurred 13,198 cases of measles, from which there were only 25 deaths, a fact which indicates that Milwaukee mothers are taking measles more seriously and are providing better medical care. The typhoid and diphtheria rates were the lowest ever recorded, only 25 deaths occurring from diphtheria and 2 from typhoid fever, one of which was a non-resident.

**Saskatchewan, Can.**—The estimated population of the Province of Saskatchewan for 1928 was 851,000, of which 17.9 per cent resided in towns of 1,000 and over.

The 19th annual health report includes the Vital Statistics Report and is composed of 150 pages, 94 tables, and 26 diagrams, giving detailed information concerning every phase of the department's work. The report shows a total expenditure for health activities of \$794,967 during the fiscal year 1928-1929, which is an increase of \$108,331 over 1927-1928. Of the per capita expenditure of 94.4 cents, 62.1 cents were used as aid to hospitals and sanatoriums, 10.5 for child welfare, hospital management, sanitation, and disease prevention, and 3.6 for school health supervision. Regulations and legislation passed during the year include the

medical examination of employees in hotels and other places, and provision for the formation of "Full-Time Health Districts."

On May 1, the School Hygiene Bureau of the Department of Education was transferred to the Department of Public Health, for which a new branch was created, the Division of Public Health Nursing. A nurse is in charge of each district, which comprises about 6 municipalities. Both school and home visiting is planned, thus including both school and preschool groups. Prenatal work is possible, and material aid is often given in procuring the government maternity grant. In 1928, 1,025 schools were visited and 31,737 children inspected; in 93 preschool clinics 3,546 children were examined, and 9,222 homes were visited.

During the year, 6 new hospitals were added to the list of those receiving government aid. The Province had, in 1928, 3.9 hospital beds per 1,000 population, or 1 bed for every 253.8 persons. Seven per cent of the population had hospital treatment, each patient remaining for an average of 12.3 days. Of the total births, 26.7 per cent took place in a government aided hospital. The report deals in detail with the hospital situation, tables being given which present for each hospital the bed capacities, nursing data, costs and expenditures.

**Mississippi Flood Disaster**—The American National Red Cross has published a highly interesting and enlightening report of 152 pages on the Mississippi Valley Flood Disaster of 1927. This official record of the greatest relief operations in the history of the organization, and of the administration of the large fund of 17 million dollars, should prove of interest not only to those directly affected by the floods, but

to all who aided in the work or contributed to the relief fund. The report is dedicated to the men, women and children whose sympathy and generosity made possible the relief of 637,000 persons suffering in this great disaster.

The report contains 7 chapters and 12 appendixes, including an excellent bibliography, besides 31 illustrations, charts and maps. The chapters deal with The Flood, Relief Fund Campaign, Organizing Relief Forces, Emergency Period, Reconstruction, Medical and Nursing Service, Financial Control and Audit. Medical and Public Health Measures are described in detail and include an excellent account of the work of nurses. One of the results of the flood was the establishment of full-time county health units in 85 of the flooded counties. The Rockefeller Foundation, in coöperation with the Mississippi Board of Health, also established a training station at Indianola where physicians, nurses and sanitary officers were trained in the practical procedures of public health work. There were 235 health workers, including 85 physicians, 84 nurses and 92 sanitary officers, in training at this center for an average period of 1 month.

**Macon City and Bibb County, Ga.**—The sixth annual report of the Joint Board of Health for the City of Macon and the County of Bibb, Ga., consists of 48 pages, well printed and bound in light blue covers. The estimated population of the county, including city, was 83,765, of which 46,124 were white persons. A death rate of 12.3 for the white and of 16.6 for the colored population is recorded. Infant mortality has been reduced from 156.6 in 1923 to 68.4 in 1929, while the tuberculosis death rate has declined from 152.6 in 1923 to 89.8 in 1929.

Pellagra cases last year showed a marked increase over the previous year. The department has for several years

kept a supply of yeast for distribution to pellagra cases, and the deaths have decreased. Among the health officer's recommendations are noted the desirability for an increased sewage disposal system (1,266 houses not now being connected in the city of 63,475 population); provision of an incinerator; a contagious disease ward at the Macon Hospital; and provision for hospital care of advanced cases of tuberculosis.

There were 104 prenatal clinic sessions with an attendance of 1,669. There were 52 well baby conferences with an attendance of 535. There were 18,145 children examined by physicians. The laboratory reports 7,566 specimens examined. Expenditures for the year amounted to \$48,315.

**Brookline, Mass.**—The 1928 report shows an appropriation of \$258,355 and a recommended budget of \$252,731 for 1929, including a hospital relief fund of \$5,109.67 for indigents. A substantial amount has been asked for preventive work, especially the diphtheria vaccination clinic, the health center clinics, the dental and medical inspection of schools, and the school in bodily mechanics. Deaths from cancer show a 30 per cent increase; and pneumonia shows an increase from 25 deaths in 1927 to 44 in 1928.

It is exceedingly difficult for Brookline to compute its birth and death rates on account of the hospitals taking in so many outside patients, and natives of Brookline tend to go away for treatment. The death rate was 11.55, but corrected for residents it was 10.75. In 1927, 70 per cent of the births occurred outside of Brookline. The births and infant mortality rates include only infants of Brookline mothers and exclude births and infant deaths of non-residents. The live birth rate was 11.8 and the infant mortality rate 51.7.

At the health center, 76 preschool children were immunized. The 91 tu-

berculosis clinics made 590 examinations of 277 individuals, of which 106 were new. Twenty-one hundred and thirty home visits were made by nurses.

**Lowndes County, Ga.**—A good example of what may be done in preparing an attractive and complete report at a moderate expense is that by the Board of Health for 1929. The 16 mimeographed pages give a concise and carefully planned summary of the work for the year, still leaving room for a pleasing title page and artistic division headings.

The staff of the board of health consists of a commissioner, visiting nurse, technician, and secretary. The visiting nurse has under supervision in the county 65 colored midwives. They are organized into 3 clubs at the monthly meetings, at which the health officer or nurse is present. More than 50 per cent of the births in the county are attended by the midwives, nearly all of whom are visited and given instructions by the nurse. The infant mortality rate in 1929 was 42.2 per 1,000 births. A medical inspection was given to all school children in the county, totaling 2,558, of which 1,016 were found to have defects.

The general death rate was 11.7 per 1,000 as compared with 13.4 for 1928. Typhoid fever has declined from 45 cases in 1927 to 8 in 1929. A slight increase in diphtheria cases was noted, as well as in cases of scarlet fever, malaria, influenza and pellagra.

**Glendale, Calif.**—The annual report of the City Manager for the year 1928–1929 covers 100 pages, illustrated with maps, charts and statistical tables, accompanied by interesting descriptive text. The administration program of the year was carried out with a tax rate of \$1.26 per \$100 on the assessed valuation of taxable property. At the close of the year the City Council decreased

the tax levy to \$1.21. It is noteworthy that operation of the general government has been carried out during the last seven years without a deficit.

Joint arrangement between the city and county was made for the conduct of the health department. This added to the facilities and service afforded and reduced costs. Agreement entered into with the county health authorities calls for the erection and equipment of a health center building by the county on a site to be supplied by the city. Clinics held in the health department include those dealing with cases involving general medicine, surgery, eye, ear, nose and throat, gynecology, pediatrics, health education, orthopedics, physiotherapy, chest, dental service, and child welfare, and prenatal conferences.

The general health record of the city is good.

**Dayton, O.**—An infant mortality rate of 63 for 1929, as compared with a rate of 66 in 1928, and a general death rate of 11.6 are recorded in the annual report of the health department, published in the January, 1930, *Monthly Bulletin*. "The hub of the health wheel is the laboratory." There were 27,424 examinations last year. In the food inspection bureau, stress is placed upon such matters as healthy food handlers, wholesome food products and sterilization of utensils. In 1929, 17,955 utensils were collected from food establishments for laboratory tests and 13,465 food handler cards were issued after physical examinations were made.

The public health nurses made 62,720 home visits including 911 in homes of preschool children to urge physical examinations in the Summer Round-up. "The Summer Round-up of preschool children is proving an important factor in educating parents in the responsibility of health supervision of their children." All certified milk in Dayton is also pasteurized.

# A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

**Reporting on BCG**—This preliminary statement of the effect of vaccinating children exposed to tuberculosis is eloquent of the care being taken to make the study scientifically significant.

ANON. Present Status of BCG Vaccination Against Tuberculosis. *Weekly Bull.* (New York City Dept. of Health), 19, 22: 173 (May 31), 1930.

**The Children's Hour**—The Health Commissioner of New York City proposes that physicians designate an hour at which they will examine well children and give advice to mothers. The physicians are urged to set a fee and permit their names to be listed. An eminently sensible scheme.

ANON. Preventive Medicine and Private Physicians. *Weekly Bull.* (New York City Dept. of Health), 19, 24: 189 (June 14), 1930.

**Immunity to Poliomyelitis**—Tests are reported which indicate a widespread immunity to poliomyelitis among individuals not known to have had the disease. This immunity originates in exposure, the virus being spread by person-to-person contact. A very convincing demonstration.

AYCOCK, A. L., and KRAMER, S. D. Immunity to Poliomyelitis in Normal Individuals in Urban and Rural Communities as Indicated by the Neutralization Test. *J. Prev. Med.*, 4, 3: 189 (May), 1930.

**Uterine Cancer**—The part played by interference with labor in the production of uterine cancer is convincingly portrayed, and the obvious preventive measures are ably discussed.

BLAND, P. B. Remarks on the Prevention of Uterine Cancer. *New Eng. J. Med.*, 202, 25: 1195 (June 19), 1930.

**Occupational Mortality**—A special analysis of an important investigation

into occupational mortality, presenting some of the findings from the point of view of the industrial hygienist, will be found interesting by all sanitarians.

BRITTEN, R. H. Occupational Mortality as Indicated in Life Insurance Records for the Years 1915-1926. *Pub. Health Rep.*, 45, 22: 1250 (May 30), 1930.

**Syphilis Incidence Among Negroes**—Blood Wassermanns performed upon a large and unselected group of rural negroes over 9 years indicate an incidence of 19.3 per cent of all males and 18 per cent of all females.

CARLEY, P. S., and WENGER, O. C. The Prevalence of Syphilis in Apparently Healthy Negroes in Mississippi. *J. A. M. A.*, 94, 23: 1826 (June 7), 1930.

**Anti-tuberculosis Program**—The future program differs from the present in intensity rather than kind, and we must continue to build more solidly on the same foundations upon which we have built for the past quarter century. So concludes the Managing Director of the N. T. A.

EMERSON, K. Where Are We Going in Tuberculosis Control? *New Eng. J. Med.*, 202, 22: 1039 (May 29), 1930.

**Mississippi Milk**—The adoption of a standard milk ordinance in Mississippi has given three-quarters of the state's urban population milk of high sanitary quality and increased milk consumption.

FUCHS, A. W., and KROEZE, H. A. Results of the Operation of the Standard Milk Ordinance in Mississippi. *Pub. Health Rep.*, 45, 25: 1412 (June 20), 1930.

**Viosterol and Rickets**—Doubters have arisen to question the rickets preventive potency of viosterol. The research reported here indicates that the recommended dosage should be tripled,

that all is not perfect in the manufacture or standardization of the product, but that viosterol is still a remarkable curative agent, reliable and very rapid in action.

HESS, A. F., *et al.* Newer Aspects of the Therapeutics of Viosterol (Irradiated Ergosterol). *J. A. M. A.*, 94, 25: 1885 (June 14), 1930.

**Teaching Parents to Teach Health**—That more must be said than "teach your little son to eat spinach" will be evident to all who read this brief and interesting statement.

GRUENBERG, S. M. Parent Education and Child Health. *Pub. Health Nurse*, 22, 6: 283 (June), 1930.

**Human Milk Flow**—Records of milk production show significant output changes from hour to hour and day to day which must have an appreciable influence on the nursing.

MACY, I. G., *et al.* Human Milk Flow. *Am. J. Dis. Child.*, 39, 6: 1186 (June), 1930.

**Adult Serum and Measles**—Immune adult serum was found to be almost as efficacious as convalescent measles serum. It has the advantage of being readily available and is free from the disadvantage of prejudice against the serum of strangers.

MORALES, E. G., and MANDRY, O. C. Relative Prophylactic Value of Convalescent and Immune Adult Measles Serums. *Am. J. Dis. Child.*, 39, 6: 1214 (June), 1930.

**What We Know About Tuberculosis**—The things we know about tuberculosis that are not so, and the things we know we don't know. Another unsettling paper, which really settles; the kind that the English do so well.

MUNRO, W. T. Some Tuberculosis Problems. *Med. Off.*, 43, 24: 267 (June 14), 1930.

**Iodine and Goiter**—This is noteworthy: "The administration of iodine to deficiently fed rats was definitely fa-

vorable to goiter production. . . . All grades of goiter were more common in deficiently fed rats to whose food iodine was added than in those to whose food iodine was not added."

McCARRISON, R. A Goiter Survey in Albino Rats. *Brit. M. J.*, 3621: 989 (May 31), 1930.

**Epidemic Meningitis**—Statistics of a Detroit epidemic of meningococcus meningitis (1928-1929) indicate an organism of unusual virulence. The fatality was highest in young children and adults; the colored population came in for more than its share.

MORTON, J. F., and GORDON, J. E. Meningococcus Meningitis in Detroit, 1928-1929. *J. Prev. Med.*, 4, 3: 207 (May), 1930.

**Controlling Infectious Diseases**—That doubts exist in the mind of the British Medical Officer of Health about the infallibility of our conceptions of isolation, disinfection and immunization will seem strange to American sanitarians who are wont to be so sure in their beliefs.

MUIR, W. A. The Administrative Control of Infectious Diseases. *J. Roy. San. Inst.*, 50, 12: 717 (June), 1930.

**Syphilis Control Through Coöperation**—Eloquent pleading by a master for an effective coöperation between practicing physician, public clinic, and other properly associated agencies.

STOKES, J. H. The Coöperation of the Practitioner and Organizational Forces in the Control of Syphilis. *New Eng. J. Med.*, 202, 23: 1087 (June 5), 1930.

**Public Health Administration**—The author says: "I deem it more profitable to consider the broad basic principles of public health administration rather than the details of procedure." He considers them excellently.

McLAUGHLIN, A. J. Public Health Administration. *Pub. Health Rep.*, 45, 21: 1191 (May 23), 1930.

**The School Child's Welfare**—It appears that there is much that is wrong with the up-to-the-minute educational program. The author points the dangers to the school child's health and urges their correction.

VAN DER BOGERT, F. Education, Health, and Health Education. New York State J. Med., 30, 12: 708 (June 15), 1930.

**Victor Clarence Vaughan**—The life and works of this great leader in public health are fittingly portrayed in a series of articles in a memorial num-

ber of the magazine of which he was the first editor-in-chief.

VAUGHAN, W. T., *et al.* Victor Clarence Vaughan. J. Lab. & Clin. Med., 15, 9: 817 (June), 1930.

**Gonorrhea Prevention**—The status of gonococcus infection, what we are doing about preventing the spread of the disease, and what we ought to be doing about it are all excellently told.

PELOUZE, P. S. The Prevention and Treatment of Gonorrhea. New Eng. J. Med., 202, 26: 1233 (June 26), 1930.

## BOOKS RECEIVED

**BOARD MEMBERS' MANUAL.** Prepared by The National Organization for Public Health Nursing, Inc. New York: Macmillan, 1930. 127 pp. Price, \$1.25.

**PHYSIOLOGY AND BIOCHEMISTRY OF BACTERIA.** Vol. II. Effects of Environment upon Microorganisms. By R. E. Buchanan and Ellis I. Fulmer. Baltimore: Williams & Wilkins, 1930. 709 pp. Price, \$7.50.

**PHYSIOLOGY AND BIOCHEMISTRY OF BACTERIA.** Vol. III. Effects of Microorganisms upon Environment. Fermentative and Other Changes Produced. By R. E. Buchanan and Ellis I. Fulmer. Baltimore: Williams & Wilkins, 1930. 575 pp. Price, \$7.50.

**THE PROGRESS OF LIFE.** A Study in Psychogenetic Evolution. By Alexander Meek. New York: Longmans, Green, 1930. 193 pp. Price, \$4.20.

**HEALTH ESSAYS.** By Horace W. Soper. Boston: Badger, 1930. 41 pp. Price, \$1.00.

**THE AMERICAN SCHOOL AND UNIVERSITY.** 3d ed. New York: American School Pub. Corp., 1930. 571 pp. Price, \$5.00.

**PHYSICAL DIAGNOSIS.** By Richard C. Cabot. 10th ed. New York: Wood, 1930. 529 pp. Price, \$5.00.

**THE ART OF SOCIAL DANCING.** A Text Book for Teachers and Students. By Lawrence A. Hostetler. New York: Barnes, 1930. 140 pp. Price, \$2.00.

**REPORT ON FIFTH INTERNATIONAL CONGRESS OF MILITARY MEDICINE AND PHARMACY, LONDON, ENGLAND, MAY, 1929.** By William Seaman Bainbridge.

**TRAUMA, DISEASE, COMPENSATION.** By A. J. Fraser. Philadelphia: Davis, 1930. 524 pp. Price, \$6.50.



## NEWS FROM THE FIELD

### NATIONAL LEPROSARIUM AT CARVILLE

THE National Home for Lepers maintained by the U. S. Public Health Service at Carville, La., admitted 49 new patients during the year. The average for the year was slightly more than 300 patients. Nineteen patients were released as no longer a menace to the public health; 6 additional patients complied with the requirements for parole, but owing to their deformities and disfigurements which could not be cured, they elected to remain in the hospital rather than be subjected to the hardships and humiliations which are frequently the portion of many paroled lepers.

Chaulmoogra oil, by mouth, was used as routine treatment in 137 patients, the dosage ranging from 9 to 375 drops daily. One hundred and eighty patients are taking hypodermic injections of a special derivative of chaulmoogra oil. Dental work has continued. Supplementary treatment by means of physiotherapy and special light treatments are also given.

### TEXAS TUBERCULOSIS ASSOCIATION

AT a meeting on June 16, the Texas Public Health Association changed the name of that organization to the Texas Tuberculosis Association.

### NEW YORK STATE PUBLIC HEALTH COMMISSION

THE first meeting of the Special Public Health Commission recently appointed by Governor Franklin D. Roosevelt was held at the Academy of Medicine in New York City on June 5. Dr. Livingston Farrand, President of Cornell University, as Chairman of the Commission, presided. The Governor's

purpose in appointing this Commission is to have a study made of the public health needs of the state and of the working of the various state and local health authorities and their relations one to the other. It is 17 years since a similar Governor's Commission in New York brought the state to the front rank in this important field.

Among the major topics to be considered are: adequate hospital and medical care for the sick; development of full-time local health service on the county basis and for the larger cities; and the future needs in mental hygiene.

The studies of the Commission will be devoted to making available to the people of the state the practical application of every proven means of health protection and disease control.

### NAMED ON WHITE HOUSE COMMITTEE

DR. Theodore B. Appel, Pennsylvania State Secretary of Health, has been appointed a member of the public health administration committee and a member on the sub-committee of state health organization on President Hoover's White House Conference on Child Health. Dr. Mary Riggs Noble, chief of the preschool division of the State Health Department, is on a committee of medical care for children, and Dr. C. J. Hollister, chief of the dental section, is a member of the technical advisory committee on dental hygiene in schools.

### GLOVERSVILLE PHILANTHROPIST DONATES FUNDS FOR PUBLIC HEALTH WORK

LUCIUS N. Littauer, Gloversville glove manufacturer and philanthropist, has presented \$25,000 to Simmons College of Boston for the purpose of

broadening the scope of its work in public health. Mr. Littauer has advanced other large sums for research in pneumonia and the chemotherapy of cancer.

#### SCIENTIFIC EXPEDITION INTO BORNEO

DR. Bruce Magill Harrison, professor of biology at the University of Southern California, is spending the summer in the interior of Borneo on a scientific expedition sponsored jointly by the University of Southern California and Universal Pictures Corporation.

Dr. Harrison, who has had many years of preparation in biological research, has given valuable service in the division of biological sciences at the University of Southern California, has revealed rare ability for the undertaking of so important a task as this expedition.

#### UNIVERSITY OF SOUTHERN CALIFORNIA

DR. Wilder Dwight Bancroft, professor of chemistry at Cornell University and editor of the *Journal of Physical Chemistry*, gave the dedicatory address when the Hall of Science of the University of Southern California, the final wing of which has recently been completed, was formally dedicated on June 6.

#### FEDERAL BUREAU IS ORGANIZING TO ENFORCE PRODUCE LICENSING LAW

RULES and regulations for the administration of the Perishable Agricultural Commodities Act for the licensing of commission merchants, dealers and brokers, which was signed by President Hoover June 10, are being prepared by the Bureau of Agricultural Economics.

This law, intended to suppress certain unfair and fraudulent practices in the marketing of fresh fruits and vegetables in interstate and foreign commerce, requires the licensing of commission merchants, dealers, and brokers. All persons subject to the Act who plan to be in business on and after December 10,

1930, must obtain licenses from the Secretary of Agriculture.

#### LULU HUNT PETERS DIES

DR. PETERS on her way to London to attend a meeting of the Royal Sanitary Institute contracted pneumonia, and died in a nursing home in London on June 28. She was a member of the American Public Health Association and was travelling in company with the A. P. H. A. delegates enroute to Dresden.

She is well known for her writings on dietetics. Her best known book is *Diet and Health with Key to the Calories*.

Dr. Peters was decorated by both the Serbian and Albanian Governments for post-war child welfare and public health work in the Balkans, under the American Red Cross. She was a member of many medical organizations.

#### NEW MEXICO PUBLIC HEALTH ASSOCIATION

THE 6th Annual Meeting of the New Mexico Public Health Association was held in Albuquerque, June 3 and 4. The following officers were elected: *President*, Dr. J. G. Holmes, Alamogordo; *Vice President*, Marie A. Brunk, R.N., Las Cruces; *Secretary-Treasurer*, Paul S. Fox, C.E.

The next annual meeting will probably be held in May, 1931, in Santa Fe.

#### VACCINE TO CURE COLDS

DR. J. A. Pfeiffer, associate of the University of Maryland Medical School, believes he has discovered the micrococcus that causes the common cold, and that he has succeeded in separating it and making a vaccine that will immunize the patient from one to three years. This is the result of seven years' research.

#### WILLIAM L. STEVENSON

ON June 2, Franklin and Marshall College at Lancaster, Pa., con-

ferred upon William Lawrie Stevenson, Chief Engineer of the Pennsylvania State Department of Health, the honorary degree of Doctor of Science. Mr. Stevenson is a member of the class of '97 of the University of Pennsylvania and the early years of his work were with the City of Philadelphia, where from 1908 to 1918 he was assistant engineer in executive charge of experimental and design work on sewage treatment. During the World War, he was Sanitary Engineer for the U. S. Shipping Board and in charge of their Clearance Bureau at Philadelphia. Since 1919, he has been with the State Department of

Health and since 1922 Chief Engineer. He is a Fellow of the A. P. H. A., Public Health Engineering Section.

#### JANE H. RIDER

ON June 4, the University of Arizona conferred upon Jane H. Rider, Director of the Arizona State Laboratory, the degree of Civil Engineer for outstanding work along public health engineering lines in Arizona. Miss Rider is a graduate of the University. Since 1913 she has been with the Arizona State Board of Health Laboratory and director since 1919. She is a member of the A. P. H. A.

## PERSONALS

DR. JOHN O. McREYNOLDS was elected to the presidency of the State Medical Association of Texas recently.

DR. HAROLD H. GOLDING has been elected Health Officer of Peekskill, N. Y.

DR. EDWARD A. LANE, formerly assistant director of the Division of Communicable Diseases, Massachusetts Department of Public Health, has recently become director of communicable disease control of the Westchester County Health Department, N. Y.

DR. WILLIAM E. BULLARD, Health Officer of Larchmont and Mamaroneck, N. Y., died recently at Saratoga Springs.

DR. JAMES W. DOUGLASS, Health Officer of Ava, N. Y., died recently.

DR. JOHN B. WEST, Washington, D. C., sailed in June for Abyssinia, where he will become physician to the emperor of Ethiopia.

DR. GEORGE R. ENLOE, Fort Worth, Tex., was elected president of the Texas Railway Surgeons' Association at its annual meeting, May 5.

## CONFERENCES

August 26-28, Eighth Texas Sanitarians Short School, held with Texas State Department of Health and the City of Amarillo, Amarillo, Tex.

September 8-12, American Congress of Physical Therapy, St. Louis, Mo.

September 29, week, National Safety Council, Chicago, Ill.

October 11-19, National Dairy Exposi-

tion, St. Louis, Mo.

October 20-25, American Hospital Association, New Orleans, La.

October 22-24, International Association of Dairy and Milk Inspectors, Cleveland, O.

October 27-30, American Public Health Association, Fort Worth, Tex.

## RECENT PUBLICATIONS IN THE BOOK SERVICE DEPARTMENT

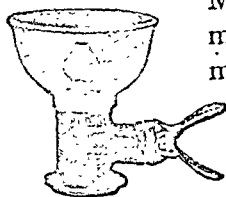
- Board Members' Manual. For Board and Committee Members of Public Health Nursing Services. Prepared by The National Organization for Public Health Nursing. \$1.50
- Science in the Service of Health. By ELLIOTT R. DOWNING. \$2.00
- Physiology and Biochemistry of Bacteria. Vol. II. By R. E. BUCHANAN AND ELLIS I. FULMER. \$7.50
- Physiology and Biochemistry of Bacteria. Vol. III. By R. E. BUCHANAN AND ELLIS I. FULMER. \$7.50
- The Healthy-Minded Child. Edited by NELSON ANTRIM CRAWFORD AND KARL A. MENNINGER. \$1.75

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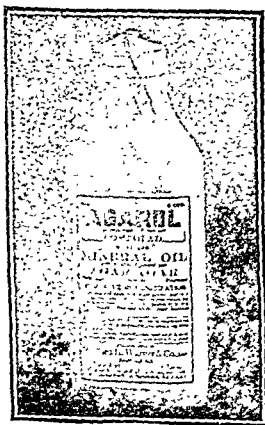
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# American Journal of Public Health

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## The Pan American Sanitary Bureau

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THE growing importance of the relations of the peoples of each American Republic with those of every other makes it incumbent upon all Americans, North, Central and South, to become fully informed of these relations and to be informed particularly with regard to questions of an international character. The object of this paper is to sketch briefly the origin and development of the work of the Pan American Sanitary Bureau and the closely related Pan American Sanitary Conferences.

The Pan American Sanitary Bureau is a permanent international health organization in which all of the American republics are represented and to the support and maintenance of which they all contribute funds in proportion to their populations. The bureau is concerned in maintaining and improving the health of all of the people of these 21 American republics and also in preventing the occurrence and spread of transmissible diseases in international commerce, particularly the international commerce of the republics concerned. It is composed of members chosen from different American republics, who meet periodically, and of a force of employees who, under the supervision of the Director of the Bureau, are daily occupied in carrying on its work. Its home is in the building of the Pan American Union in Washington, D. C., and it is the executive organ of the Pan American Sanitary Conferences.

The Pan American Sanitary Conferences are composed of delegates from all of the American republics, who meet once in 2 to 4 years; elect the officers and members of the Directing Council of the Sanitary Bureau; and spend from 1 to 2 weeks in discussing and resolving international sanitary problems, particularly of the Western Hemisphere, and local sanitary problems of general interest. Since

their inception in 1902 there have been 8 Pan American Sanitary Conferences held in various American Republics.

For many years prior to the creation of the Pan American Sanitary Conferences and the Sanitary Bureau, statesmen, meeting in international conferences, treating of questions of a general nature, blindly attempted the solution of the vexing questions of international quarantines and the spread of such diseases as plague, cholera and yellow fever in international commerce, without, however, being able to improve general health conditions or obviate the drastic quarantines which would invariably follow the appearance of one of these diseases in some important commercial port. Gradually there dawned on the members of these general conferences the fact that the protection of the public health, involving as it does the prevention of the spread of communicable diseases, is a matter which must be dealt with by men who are specially trained in such work.

This opinion was crystallized and expressed in Sections 5, 6 and 7 of the Resolutions of the Second (general) Pan American Conference of American Republics, which met in Mexico City in 1902. These resolutions provided for the holding of international (Pan American) sanitary conferences; for the establishment and perpetuation of an executive body dependent upon these conferences—the Pan American Sanitary Bureau—and for funds for its maintenance, each American republic contributing to its support, according to the number of its inhabitants.

The officers and members of the Pan American Sanitary Bureau (known as the Directing Council) are elected by the Pan American Sanitary Conferences. The members of this Council, as chosen by the last conference, which was held in Lima, Peru, in October, 1927, are as follows:

*Honorary Director*, Dr. Carlos Enrique Paz Soldan, Professor of Hygiene in the Faculty of Medicine, Lima, Peru; *Director*, Dr. Hugh S. Cumming, Surgeon General, U. S. Public Health Service, Washington, D. C.; *Vice-Director*, Dr. Mario G. Lebreto, Director of "Las Animas" Hospital and Chief of the Section of Epidemiology, National Department of Health and Welfare, Havana, Cuba; *Secretary*, Dr. Sebastián Lorente, Director of Health of the Republic of Peru, Lima, Peru; *Members*: Dr. Solón Núñez F., Secretary of State for Health and Social Welfare, Republic of Costa Rica, San José, Costa Rica; Dr. Ramón Báez Soler, Sub-Secretary of State for Health and Welfare, Santo Domingo, Dominican Republic; Dr. Justo F. González, Professor of Hygiene in the Faculty of Medicine, Montevideo, Uruguay; Dr. João Pedro de Albuquerque, Director of Quarantines, National Department of Health, Rio de Janeiro, Brazil.

It is not possible, in a brief article, to give a detailed history of the work of the various Pan American Sanitary Conferences or of the Pan

American Sanitary Bureau. It should be recalled, however, that the first conference was organized in Washington in November, 1902; that it effected permanent organization by electing the members of the Sanitary Bureau, the first permanent organization of its kind; and that it cast into discard all previous quarantine measures directed against yellow fever, voting to base future measures for the control of this disease on the fact, which had recently been demonstrated, that yellow fever is conveyed in nature only by the bite of an infected mosquito.

The Second Pan American Conference also met in Washington, in 1905. This body drafted and approved a sanitary treaty, or convention, which, in great measure, standardized international quarantine procedure in the Western Hemisphere, and which was not without effect on quarantine practices, in European and Asiatic countries. This treaty was known as the Washington Convention, and was the precursor of the present Pan American Sanitary Code, adopted at the Seventh Pan American Sanitary Conference in Havana, Cuba, in 1924.

The Third Sanitary Conference provided for the establishment of relations with the International Office of Public Hygiene, of Paris, and a system of coöperation between the two offices has been developed for the mutual interchange of information regarding sanitary conditions and the presence of quarantinable diseases in the principal ports and countries of the world. This information is exchanged by cable, and is, immediately upon receipt, released to the health authorities of all countries concerned.

The Fifth International Conference of American Republics, meeting in Chile in 1923, charged the Sanitary Bureau with the preparation of an International Sanitary Code. This was done and the code was approved by the Seventh Pan American Sanitary Conference at Havana, Cuba, in 1924.

The Sixth Sanitary Conference, held in Montevideo, Uruguay, in 1920, authorized the publication of the *Pan American Sanitary Bulletin*, a monthly journal of public health, printed in Spanish, Portuguese and French. This bulletin circulates among health officers and others connected with public health work throughout the American republics, but chiefly in Latin America.

In addition, the Seventh Conference made the Pan American Sanitary Bureau the central coördinating agency and the general collection and distribution center of sanitary information to and from the American republics. In order to carry out this work, the Sanitary Bureau was authorized to designate representatives to visit and confer with the sanitary authorities of the various signatory governments on public health matters. Previous and subsequent authorizations provide for

traveling representatives to engage in such special coöperative work as may be agreed upon at the various conferences, limited only by the available funds and the expressed wishes of the coöperating governments.

Under a resolution adopted by the Fifth International Congress of American States, the Pan American Sanitary Bureau is authorized to call together in Washington, from time to time, the Directors of Health of the various American republics. The first such meeting was held in Washington in September, 1926, under the auspices of the Pan American Sanitary Bureau. Its chief work was the preparation of a program for the Eighth Sanitary Conference which was held in Lima the following year. The Directors of Health will meet again in Washington in 1931.

In addition to the duties which have been mentioned, the Sanitary Bureau publishes the reports of the proceedings of the sanitary conferences, and acts as a consulting bureau or source of information for health departments of the various republics. The way in which the office functions as a consulting bureau can best be illustrated by concrete examples. The following instances show the very close coöperation maintained.

1. A given food product manufactured in one republic and extensively sold in another caused considerable uneasiness with regard to its value and safety, and the propriety of its further use was questioned. The Sanitary Bureau was asked for pertinent information with regard to its production and composition. This information was obtained and promptly forwarded to the Director of Health of the country where the article was being sold.
2. After many years of absolute freedom from smallpox, this disease was re-imported into one of the American republics. Seven cases developed, which were promptly isolated, and an intensive campaign of vaccination and re-vaccination was immediately begun; the Director of Health was importuned to close schools, theatres and other public assembling places. He cabled the Sanitary Bureau for an expression of opinion with regard to the necessity for such drastic action. The opinion was expressed that the measures already employed, if thoroughly carried out, should be sufficient to control the disease, and that it was believed to be safe to await further developments. No further cases occurred from this outbreak.
3. At the request of a European government, the Office International d'Hygiène Publique cabled the Sanitary Bureau, asking if a reported increase of plague in a certain American Republic materially increased the danger from this disease to trans-Atlantic ports, and, further, the question was asked whether or not vessels sailing from the country infected could be considered safe upon arrival. The opinion was expressed by the Sanitary Bureau that the increase in plague did not materially increase the danger to trans-Atlantic ports. The Office International was further informed that, while outgoing measures were being enforced in the infected country, conditions were such that, if vessels arrived at trans-Atlantic ports with evidence of living rats on board, fumigation might reasonably be required of such



vessels. Three days later a vessel arrived at a European port from the country in question and, upon fumigation, 7 plague-infected rats were found.

The tour of duty of Dr. John D. Long and that of Dr. C. R. Eskey, Traveling Representative and Epidemiologist, respectively, of the Pan American Sanitary Bureau, are indicative of another type of coöperation in public health work. Dr. Long during the past two years has visited most of the capitals of the member republics. He confers with the National Directors of Health and with other high officials and aids them in solving sanitary problems of general interest, and advises with regard to needed legislation and public health organization and administration. During the past several months Dr. Long and Dr. Eskey have been actively coöperating with the authorities of the Republic of Ecuador in making epidemiological studies of, and in carrying on an intensive campaign against, bubonic plague. They will shortly transfer their activities to Peru where it is expected that similar work will be undertaken.

In conclusion, it may be said that, as a result of the work of the International Sanitary Conferences and the Pan American Sanitary Bureau, during the last 25 years, a better understanding has been brought about between the health authorities of the republics of America, thereby removing the necessity for the drastic quarantines which were so common in the early part of the present century, and at the same time affording greater protection of the public health. This spirit of coöperation has also fostered and directly aided in the extermination of quarantinable diseases in many ports and places where such diseases were formerly endemic.



*Desert of the Lions—The Convent, Mexico City*

# How the Nurse Can Help the Health Officer to Get His Message Across\*

## From the Standpoint of the City

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THE evolution of public health procedure since the establishment of the first officially organized municipal health department in the United States in the middle of the last century has been ably described by many authors. With the creation of the Metropolitan Board of Health of New York City under the guidance of Dr. Stephen Smith, Founder of our own Association, public health became administratively established as a recognized executive division of our city government.

In those pre-bacteriology days during which philosophic discussion played such a large part in determining the ill effects of epidemic conditions, it was but natural that the sanitarian placed great stress upon the influence of environment on man's health. Departments were organized to combat nuisances, to supervise systems of scavenging, to regulate packing houses and rendering plants and, in general, to supervise features of municipal sanitation. Some attention was paid to the improvement of water supplies and the disposal of sewage. These latter activities were, of course, successful in reducing the death rate from typhoid fever and other water-borne and filth diseases.

The features of the then existing health program were such as we would now group among those performed collectively by the city administration, which cannot be efficiently administered by the individual citizen. No heed was taken of the important rôle which we now know the individual plays in serving as a vector for the conveyance of infection. The researches of the bacteriologist revolutionized our conception of the mode of transmission of most epidemic diseases. Thus there was created a more logical system of quarantine and isolation based upon bacteriologic control. Such an administrative system made possible further progress in the control of disease but was not without its limitations as it was soon discovered that quarantine of

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\* Read at a joint meeting of the Child Hygiene and Public Health Nursing Sections of the American Public Health Association at the Fifty-eighth Annual Meeting at Minneapolis, Minn., October 4, 1929.

clinical cases in itself would not suffice to prevent the spread of infection. The healthy carrier, the mild case and the missed and undiagnosed case, played too large a part in the dissemination of infection. An appreciation of the limitations of quarantine together with the discoveries of the immunologist in the art of stimulating artificial protection against disease has finally led the public health administrator to an appreciation of the fact that education is the keynote on which all administrative policies of the modern health department should be built.

It is in this third developmental period of public health administration that the nurse is playing so important a part. While it is true that the layman continues to picture his health department as largely engaged in the supervision of epidemic diseases and the abatement of nuisances and offenses to the eye and nose, the administrator himself appreciates that his principal task is not to solve the vexing and annoying problems of the unusual but devastating epidemic, but rather to create an enlightenment in the public mind so that the individual citizen may appreciate his responsibility in keeping himself well and thus serving as a unit of a healthy community.

Public health administration is becoming more and more a problem in salesmanship. The city or county which is doing the most to teach its people the causes and means of control of disease and which is inculcating into the daily habits of its children the practice of hygienic living, is enjoying more vigorous health and is gradually lengthening the life of its citizens, thereby reducing its own death rate. There are many ways of selling health to the public. Popular health instruction through the medium of the printed page has done much to modernize the layman's conception of disease prevention. The daily or weekly newspaper as well as the health department bulletin, the movie, the radio and the lecture course plays an important part in the health education program. It can, however, be said without fear of contradiction that the most important single factor in teaching positive health is the public health nurse.

The *Appraisal Form* published under the auspices of this Association is generally recognized as an instrument which aims to express in terms of group judgment the value of the health program being administered by any city or county. An examination of this *Appraisal Form* would indicate that there is no division devoted exclusively to public health nursing. On the other hand a careful analytical review of the individual items incorporated in this measuring stick would indicate that the public health nurse is associated with activities which represent nearly 50 per cent of the entire score. The teaching value of the

public health nurse has become so well recognized that, in order to have a good local public health program, between 40 and 50 per cent of the appropriation of the health department should be devoted to a division of nursing. It may therefore be concluded that we as health officers have agreed that the public health nurse constitutes our most important asset in health education.

Are we using the resources and ability of the public health nurse to greatest advantage? If the housewife is considering the purchase of a new washing machine, she may obtain some impression of the type of machine she should have from advertisements which appear in newspapers or from hand bills left at her home, but, after all, the thing which convinces her above all things is the demonstration and sales talk of the vendor at the store. Salesmanship through demonstration and expression is the most profitable means of establishing opinion. As health officers we have public health nurses as our representatives entering every home of the community. We may have a specialized nursing service in which the individual nurse has been taught to function in but a limited field such as the control of the communicable diseases or visiting at the home of the tuberculosis case. We may have generalized nursing which is now recognized as a more effective and efficient form of service and in which the individual nurse may perform duties in each of the various divisions of the medical service such as tuberculosis, communicable disease, child welfare and school services. The success with which the nurse meets in selling herself to the housewife and selling her personality and her story to the family depends upon her tact, her judgment, her training and, above all, her method of self expression.

It seems to me that too many health officers have lost sight of the fact that the public health nurse is the sole representative of the health department who reaches the average home. The family will naturally think of the health department in terms of this representative whom they have met. Up to the present time it has been the sanitary inspector who noses about the premises to ascertain whether the garbage receptacle is properly covered and whether the premises are strewn with filth or trash which is considered inimical to health. No wonder that the citizen has conceived the health department as an organization of law-enforcing officials whose duty it is to make life miserable for those lax in the care of sanitary appurtenances and an organization which occasionally sends around an officer to tack up a quarantine sign and inflict further unwelcome hardships upon the family life.

The public should think of the health department in terms of the nurse as an educator, as a friendly guide and consultant to assist in

solving the many simple but perplexing problems which accompany motherhood and child-raising. Let us substitute the vision of the sympathetic nurse for the unwelcome shadow of the law-enforcing officer. Some health departments have been endeavoring for the past few years to transfer the supervision of nuisances which are merely esthetically unpleasant in contra-distinction to those conditions of our environment which are inimical to our health to the police department of the municipality.

The health department because of the misconception which existed at the time when our official health organizations were first established, has fallen heir to many practices which are not rightfully its own. The public should look to the police department for matters of police protection including the safeguarding of the human sensory system against nuisances created by others. The citizen should look to the health department to satisfy the thirst for knowledge regarding disease prevention and vigorous health.

Are our nurses properly instructed so that they can serve as the sole representatives of the health officer in the home? They should know something about their own department, its purposes and aims and about public health in general. They should have some knowledge of vital statistics; there should be some conception of the meaning of death and birth rates. They should not be expected to learn a long list of figures which of themselves would be rather dry and uninteresting, but they should know whether 15 per 1,000 is a high or low death rate, and whether 40 per 1,000 births is a high or low infant death rate. They should have some knowledge of what the city is doing to supervise its milk and food supply. They should know what is being done in the field of sanitation and industrial hygiene, whether poor housing facilities have any relationship to ill health, and if so what are the features of ill-housing which most closely affect the incidence of disease. In short, the public health nurse should be conversant with the various activities of not only her own health organization but also those other organizations, whether official or nonofficial, which are assisting in the local health program.

Every health department should have a well established program whereby the new nurse receives instruction in public health administration and in the various organizational divisions of health work. These courses of instruction should be compulsory not only for new nurses, but a shortened course of instruction should be given to the older nurses in order that they may be kept in constant touch with newer developments and posted concerning the changes in departmental policy. If a program of this character is not effectively car-

ried forward by the health officer, he is missing a wonderful opportunity to sell public health to the people of his community.

Dr. Hastings has frequently made the statement that in order to be successful as a teacher of health the nurse must be a good conversationalist. I have heard Dr. Hastings state that he was not primarily interested in seeing the credentials of the new nurse employed by the Toronto Health Department, although it goes without saying that the credentials must be of the highest in order to obtain appointment in that organization, but he was particularly interested in having a 5-minute conversation with the new nurse to ascertain her ability for self expression. We are not suggesting that the public health nurse become an incessant talker or even a mechanical doll, but we are suggesting that she be taught the rudimentary facts of public health administration seasoned with much information of local application so that she may intelligently act as a saleswoman for the health department.

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## Increased Incidence of Epidemic Poliomyelitis in Southern California

THE California State Department of Public Health<sup>1</sup> recently reported a steadily mounting incidence of acute anterior poliomyelitis. Statistics were quoted for January, February, March, April, and the first three weeks of May, 86 cases in all being reported. Since then, 151 cases have been reported, making a total of 237 from January 1, 1930, to date. Further analysis as to age groups affected of 131 cases in June so far, indicates that 75 per cent are over 5 years of age. This brings the age group well within those attending summer camps, thereby constituting at this time a public health problem of no mean consequences. Moreover, this disease manifests itself ordinarily in the late summer and fall and increased incidence in early summer is generally an epidemiologic indication of the disease reaching epidemic proportions.

It is extraordinarily interesting to note that approximately 85 per cent of the cases were reported from Riverside, Orange, San Bernardino, San Diego and Los Angeles Counties. Furthermore, under such conditions, it is necessary that physicians scrutinize with all suspicion, any illness, particularly of the respiratory or digestive tract, in the affected age groups for the probable incidental paralysis may not occur in many cases. The control measures are well established but their effectiveness is uncertain mainly because of the healthy carrier.

### REFERENCE

1. Calif. State Dept. *Pub. Health Bull.*, June 7, 1930.

# Animal Infections with Bacteria of Genus *Brucella* and Their Relation to Undulant Fever of Man\*

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YOUR Program Committee has asked me to discuss the deKruif article which appeared in *The Ladies' Home Journal* of September, 1929. I advised them that I would rather discuss with you what is known concerning the disease in animals caused by *Brucella* organisms, with special reference to its relation to undulant fever in man, and only incidentally refer to the deKruif article. This seems desirable, because, after stripping the article of its romance, exaggerations and embellishments, and after the omissions have been taken into consideration, we find that deKruif is, more or less, telling the truth.

I am glad that his article has made it possible to acquaint the reading public with the accomplishments of Alice Evans, who had already been recognized and honored by national and international bodies interested in bacteriology, medicine and public health. Aside from the opportunity to pay this well-deserved tribute to Miss Evans, the good done by the deKruif article is very questionable.

In various professional and scientific meetings and publications for the past three or four years, the attention of those interested in public health has been called to the necessity of recognizing and studying undulant fever in America, and epidemiologists and laboratory workers everywhere have been making studies. Provisions to safeguard the public health against infection have been considered and some put into effect. *The Ladies' Home Journal* article of September, 1929, may do considerable harm by forcing those making studies of undulant fever to express opinions or make regulations not supported by sufficient data.

In 1905, the British Malta Fever Commission<sup>1</sup> presented satis-

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\* Presented at a joint meeting of the Health Officers' and Dairy and Milk Inspectors' Sections at the 12th Annual Meeting of the League of California Municipalities, Oakland, Calif., October 9, 1929.

factory evidence to prove that goats' milk may be infected with a virus which is responsible for Malta or undulant fever in man, and that most of the cases in man were contracted by handling and drinking such milk.

After this report appeared, it became a rather general practice to attempt to connect all cases of illness showing symptoms which resembled those of Malta fever to the drinking of goat's milk or to other direct or indirect association with those animals. When this was not possible, especially in countries where it was not endemic, the disease often went either undiagnosed or wrongly labelled; in fact, in such places, Malta fever was most often not even considered, because, it was argued, there were no goats; or there had been no contact with goats; or there was no infection in goats and, therefore, it could not be Malta fever. Serum tests were seldom made. A complete change of attitude has taken place, first, in this country and then in others. Let us briefly trace the reason for this change of attitude.

After Smith and Fabyan<sup>2</sup> and Schroeder and Cotton<sup>3</sup> demonstrated that the *Brucella abortus* organism may be eliminated in the milk of some infected cattle, and that this organism was capable of inducing very pronounced lesions in experimental guinea pigs, it was naturally thought by a good many that possibly it was also pathogenic for man, and some evidence was gathered as early as 1911<sup>4</sup> and 1913<sup>5</sup> that such was the case. There was no thought of the relation of the abortion organism to undulant fever in man. Kennedy,<sup>6</sup> in 1914, reported the finding of agglutinins for *Micrococcus melitensis* in the milk and blood serum of cows.

Even after Miss Evans called attention to the similarity between the organism causing abortion in cattle and that causing Malta or undulant fever in man, little evidence of the pathogenicity of the bovine abortion organism for man was brought forward. The medical literature of various countries for five or six years after Miss Evans's discovery contained suggestions<sup>7</sup>; in fact, fairly good circumstantial evidence<sup>8</sup> indicates that such was the case. It was not until Keefer,<sup>9</sup> of Johns Hopkins Hospital, reported a case of undulant fever in one of the laboratory assistants, who had had no dealings with cultures, that the fact was definitely recognized that the source of the undulant fever infection in man may be other than caprine. This report was followed by more evidence presented by Carpenter and his associates,<sup>10, 11</sup> and from that time the literature in this and other countries has been full of direct and indirect evidence showing that the goat can

<sup>2</sup> Italian investigators Viviani and Fical and Allesandrini, at about this time, reported similar findings, but owing to the fact that Malta fever infection in goats exists in that country, their reports did not attract so much attention as the American reports.



no longer be held alone responsible for undulant fever in man, but that the cow and the hog must also be given serious consideration as sources of the virus.

An effort has been made to separate and differentiate the various organisms belonging to the genus *Brucella*. This has been beset by a great deal of difficulty, and at present it is far from being satisfactorily solved. However, it may be stated now that at least three varieties or groups or species of the *Brucella* organism are being recognized by many. These are *Brucella melitensis*,\* the old *Micrococcus melitensis* of Malta fever; *Brucella abortus*,† the most common cause of infectious abortion of cattle; and *Brucella suis*, the cause of placental infection and abortion in swine.

A discussion of the incidence of infections with one or more of the three varieties or species of *Brucella* organisms in man and animal may aid us in establishing the proper relationship of the disease in animals to that of man.

#### INFECTIONS IN MAN DUE TO BACTERIA OF GENUS BRUCELLA

Infections with all three varieties or species of this organism have been found in man.<sup>12</sup> For the present, we can dispense with a discussion of the *Br. melitensis* because this organism has long been accepted as the proven cause of undulant fever and, besides, we are concerning ourselves principally with human infections in localities where this variety is not supposed to exist. Miss Evans,<sup>13</sup> and I believe others, have identified *melitensis* organisms from human cases where the goat was eliminated as the source of the infection.

Regarding human infections caused by the other two varieties, a great deal of evidence is accumulating, some of it very convincing, while some is not. There is, however, only a meager amount of data which enables us to separate the bovine from the porcine infections in human beings. Huddleson<sup>12</sup> typed 35 human strains belonging to either one or the other of these two species and grouped 20 as *Br. abortus*, and 15 as *Br. suis*. I desire to emphasize that his methods of classification are not yet generally accepted and the number of strains examined is not large enough to permit general conclusions. It would not be amiss to emphasize also that variety does not necessarily indicate the source—this will become clearer from further discussion. These 35 human strains came from Rhodesia, South Africa, and from portions of the United States where the goat was not a factor in disease in man.

\* Miss Evans prefers *Brucella melitensis* (variety A).

† and *Brucella melitensis* (variety *abortus*).

## BRUCELLA INFECTION IN ANIMALS

Cases of *Br. melitensis* infection in sheep, horses, mules, dogs, cats, rats and even chickens have been reported<sup>14</sup> from various Mediterranean countries. Whether these were due to *Br. melitensis* or to other varieties of Brucella must at present remain unanswered. Infections in practically the same group of animals have been reported as also being caused by *Br. abortus*.<sup>15, 16</sup> Such cases due to either variety are very rare and are, therefore, of no great consequence in transmission of the disease to man. That infections in these animals occur is, however, worth bearing in mind.

*Goat*—That *Br. melitensis* infects this animal has been known since the British Malta Commission issued its report. The effect of this virus upon the goat is variable. As a rule, no ill effects may be noticed; at other times, abortion and mastitis in the female and orchitis in the male have been observed. Of interest is the fact that, in spite of the apparent good health of the infected animal, the organisms in large numbers are eliminated with the milk. Some authors<sup>17</sup> claim that the goat never rids itself of the infection. The urine of a large number of infected goats also disseminates the virus, and many cases of human infection are traced to this excretion.

Rare cases of goat infection with *Br. abortus*<sup>18</sup> have been reported, and probably more intimate exposure to this virus would cause more numerous infections. This possibility must be considered in making regulations concerning the sale of goats' milk in localities where bovine infectious abortion is prevalent and melitensis in goats is not present.

*Swine*—Huddleson<sup>12</sup> examined 20 strains from European and American infected swine, and all were placed in his *Br. suis* group.

The infection by this organism produces in swine a clinical picture more or less like that caused by melitensis in goats. They may be infected and show no ill effects. Infected animals may show placental and fetal infection with or without abortion. The organism may be eliminated in the milk. Males may have orchitis.

The disease has made its appearance in a limited way in California and in some of the mid-western states. In Europe, its distribution is even more limited than in the United States.\*

This infection in swine is of only general interest to dairy and milk inspectors. By health officers and epidemiologists, it should be given careful and serious consideration in their efforts to trace the source of infection in human beings, since the variety infecting swine is con-

\* In personal correspondence, Axel Thomsen advised K. F. Meyer of a serious epizootic of abortion in swine in Denmark. Cultures forwarded to Dr. Meyer were found by him on preliminary tests to be like our *Br. suis*.

sidered by some investigators<sup>18, 19</sup> as an important source of undulant fever in man in sections where *Br. melitensis* infection is not endemic.

*Cattle*—The infection in this species is no doubt of greatest importance to milk and dairy inspectors, because of its wide spread, because of the frequency with which this source has been justly and often unjustly associated with undulant fever in man, and finally because it concerns directly your official duties.

Infections with all three varieties of *Brucella* have been reported in cattle. Of 96 strains isolated from cattle, Huddleson<sup>12</sup> classifies 86 as *Br. abortus*, 8 as *Br. suis*, and 2 as *Br. melitensis*. Miss Evans<sup>13</sup> has also reported *melitensis* variety in cattle infections.

Agglutination tests on the serum from thousands of cattle in various parts of the United States showed that approximately 20 per cent have yielded positive reactions. From 30 to 50 per cent of these reactors, or from 6 to 10 per cent of the cattle, eliminated the organism in the milk. I believe that sufficient progress in controlling the disease has already been made to have considerably reduced these percentages.

In cattle, the effect of the virus is very much like that found in goats and swine. Cattle may show no indication of disease. Often infection reaches the pregnant uterus and induces inflammation of the placenta and fetus, resulting, in many instances, in abortion. This, as a rule, is not attended by any great inconvenience to the cow. Cattle may even give birth to apparently normal, full-time calves in normal manner and still have the infection in placenta and discharges, and in the udder and the supramammary lymph nodes. The infection generally leaves the uterus within 3 or 4 weeks—it rarely lasts longer—but may persist in the udder and associated lymph nodes for a longer period—in some cases, for years. However, a good proportion of infected cattle never show the virus in the udder or soon rid themselves of the infection in this organ.

Thus far, an attempt has been made to present briefly the conclusions and summaries of the available data bearing on the infection with *Brucella* varieties or species in animals and in man, and from these data we cannot escape the conclusion that, in countries or localities where *melitensis* infection in goats is not present, the infections of swine and cattle must be taken into consideration in hunting for the source of the infection causing undulant fever in man. To what extent each is responsible for such infection is not known, and the conditions under which it takes place are even a greater mystery.

It has already been pointed out that, in certain localities, the swine infection is considered an important source of the virus causing un-

undulant fever. In this connection the Keefer case, referred to early in our discussion and also made prominent in deKruif's milk article, is, from the epidemiological viewpoint, considered as possibly of porcine origin, since one of the duties of the patient had been the frequent collection of porcine fetuses from one of the Baltimore abattoirs. Smith<sup>18</sup> studied the Keefer culture and found it to be like porcine strains in its pathogenic effects on guinea pigs. It may also be stated that several of Carpenter's human strains,<sup>20</sup> apparently from milk-borne infections, are classified as *Br. suis*.

I have not attempted to analyze the large bulk of evidence collected in many portions of this and other countries to connect cow's milk with undulant fever in man. Some of it would be thrown out as insufficient to convict—some, however, is very convincing.

The fact that the infection in cattle is so widespread and affects so large a proportion of our cattle, and that such large numbers of our population are exposed to cattle infection, either by coming in contact with placental or fetal tissues which teem with abortion infection, or by consuming raw milk, cream or other raw milk products, which have resulted in comparatively few infections in human beings, has caused and still causes many to hesitate to accept cattle infection as a factor in the cause of undulant fever. These conditions simply indicate that man is very resistant to the bovine virus; nevertheless, the evidence now at hand forces one to the conclusion that certain infected cattle eliminate organisms belonging to the genus *Brucella*, which, under conditions not yet definitely understood, are capable of inducing symptoms of undulant fever in certain especially susceptible individuals.

#### PREVENTING INFECTION IN MAN FROM BOVINE SOURCES

It has already been established by controlled laboratory experiments that pasteurization,<sup>21</sup> if carried out according to the laws of California, which designate 140–145° F. for 30 minutes, will destroy the varieties of *Brucella* discussed in this paper. The *melitensis* and *abortus* species are not killed at 140–142° for 10 minutes, but are killed in 15 minutes. The porcine variety is a little more resistant and requires 20 minutes at 140° or 15 minutes at 142° to make it no longer viable. At 145°, all three varieties are destroyed in 10 minutes.

I wish to emphasize the fact that I have always been, and am at present, a proponent of efficient pasteurization as a method of making our general milk supply free from pathogenic organisms for human beings. There are, however, certain people who desire to drink raw

milk and certain physicians who recommend it; also there are certain localities in which pasteurization cannot be efficiently carried out. For this group, an effort is being made to provide, if possible, a supply of raw milk which will be free from *Br. abortus* organisms. Let us examine the known facts to see if that is possible.

It has already been stated that approximately 20 per cent of our cows are affected with abortus infection. It has been estimated from a fairly large number of guinea pig inoculations with milk that from 30 to 50 per cent—in some cases higher—of animals that react to the agglutination test will eliminate this organism, making about 6 to 10 per cent of our cattle that are eliminating organisms in their milk.

The work of Schroeder and Cotton,<sup>22</sup> Fitch and Lubbehusen,<sup>23</sup> and Carpenter and Parshall<sup>24</sup> shows that animals which do not react positively to the agglutination test for *Br. abortus* do not eliminate organisms in their milk. We<sup>25</sup> have found, however, that, in rare cases, an animal may be eliminating the organism and, at the same time, not react positively to the agglutination test. We have, however, further found that in 3 such cases one animal soon became a positive reactor and the other two ceased to eliminate the organism. King and Caldwell<sup>26</sup> obtained similar results. Thus, in a system of repeated applications of the agglutination test to cattle serums, as is now being practiced in eliminating the infection from herds, the chance of missing the rare cases which discharge the organism is further reduced.

If, in this connection, we take into consideration that the number of *Brucella* organisms in infected cow's milk is, as a rule, small,<sup>27</sup> that this is greatly diluted with milks from non-eliminating cows, and that even in the rare susceptible individual, epidemiologic studies indicate that large numbers of organisms are required to induce undulant fever, we may state that raw milk can be produced on a commercial scale which will not cause undulant fever in man.

Our present knowledge justifies such conclusion notwithstanding such statements as<sup>28</sup>: "Carpenter has pointed out that many cows which eliminate the organism in the milk do not react to the test." I made inquiry of Carpenter concerning this point, and he replied that he had published no data which would justify anyone in drawing such conclusion.

The Medical Milk Commissions of the San Francisco Bay region and also of the southern part of the state have adopted a rule by which no animal which reacts to the agglutination test is permitted to supply milk to certified milk trade. It seems only reasonable that if certified raw milk is not considered suitable for human consumption unless it comes from animals that do not react to the test, ordinary raw milk

should also not be allowed on the market unless it comes from animals which do not react.

In this effort to protect the public against possible infection with cows' milk, the goats in many places have escaped attention. It seems that the least that can be done with goats' milk is to insist that it be pasteurized, if that is possible, or that it come from animals which do not react to the agglutination test. I have not been able to locate any data on the correlation of the agglutination reactions of goat serums to the elimination of the organism in milk.

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## Sterilization

THE fallacy of this claim of wholesale sterilization lies in the fact—and it is a fact—that the great majority of certifiable defectives are not the progeny of mentally defective parents, but of apparently normal or subnormal yet more or less self-supporting citizens, whom no sterilization laws could touch or seek to touch. The majority of victims of mental infirmity come of families who are the subject of some mental instability; whose germ cells are in some way faulty, and who may only be carriers of defect *without themselves exhibiting any trace*. If every certifiable mental defective had been sterilized twenty or thirty years ago it would have made little appreciable difference to the number of defectives existing today.—Dr. Frank A. Gill, *Brit. M. J.*, July 5, 1930.

# Mental Hygiene in a Public Health Program\*

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PHYSICAL hygiene is very closely interwoven with mental hygiene, which has as its objective the greater happiness and efficiency of the individual, and thus the mental betterment of the race. The boundary line between is hypothetical, although it was not until the last two decades that mental hygiene has been given an important place in the general campaign for the improvement and well-being of humanity. In the last analysis, the body is subservient to the mind, and will be ennobled or degraded according to the type of mind to which it gives habitat. The meteoric rise of the mental hygiene movement in the last twenty years is witness to its paramount importance in any public health program.

Every constructive movement has had the justification of an urgent need and this necessity has ever been the stimulus for practical and effective action. Unless these overwhelming needs are satisfied, human nature inevitably degenerates, and human aspirations are lost in chaos. Thus humanitarians, criminologists and health workers the world over are realizing the dire necessity for the improvement of the general health of individuals and races. There never existed a more true and striking need than that which is to be found in the present necessity for mental hygiene.

It is said that there are three types of lies—white lies, black lies and statistics—but there is fascination in statistics, and if carefully studied, they depict certain facts, and these show a real danger, which is more thrilling than the fictitious dangers found in many detective stories. Statistics from hospitals in the United States show that there are more persons mentally sick than physically sick in our hospitals. The admissions to these hospitals amount to 75,000 annually. One out of every 21 persons in the general population has been or will have been at some time in a mental institution, if not given proper mental hygiene to forestall the mental illness. This is even more

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graphic when we realize that 1 out of every 7 families shows a history of insanity. Thus we find that out of the 24,000,000 children now in our schools, at least 1,000,000 are destined to be blighted by mental disease, unless mental hygiene is applied; but it is encouraging to note that at least one-half of mental disease is preventable. Nevertheless, prevention does not consist in building more hospitals, nor does it imply the treatment of already well established and chronic diseases of the mind. Its program calls for the erection of protective measures many years before mental disease may be expected to develop.

Just as physical hygiene finds its most promising field among children, so human behavior or personality is most easily influenced in the right direction during its most formative period, that is, during childhood; yet, it is difficult to define clearly what is meant by personality, human behavior, conduct, or whatever you wish to call it. Perhaps, it can be best defined as the difference between an animal and a human, or rather it is the difference between animals and most human beings. Defectives who lack intellectual endowment can scarcely be credited with the possession of personality. Much controversy may therefore be avoided by speaking of personality as the sum total of the great number of sensory-motor reactions correlated by the mind or the voluntary responses of the individual to the environment.

All will agree that the functions of the mind are not separate or distinct entities but part of the correlated whole. The old psychology taught that the mind was composed of a number of cubby-holes, and each one was supposed to hold a special faculty, such as feeling, thinking, volition, etc., and was quite distinct from the others. This conception has become inadequate and so has been discarded.

Almost everyone knows that the body is made up of a great number of organs, each one of which has a certain function, and that the function of each of these must be timed in response to certain conditions and in proper relation to the other organs of the body, or it does not efficiently serve its purpose. The stomach must secrete its juices when food is introduced; the active brain must be supplied with an increased amount of blood; the kidneys and the skin must act harmoniously to excrete their waste products, and the respirations must increase on physical exertion. It is a function of the nervous system to organize the activities of the organs of the body so that they may be properly adjusted in relation to one another. This mechanism of pseudo-intelligent correlation rests in the vegetative nervous system, the simple reflex arc, the spinal cord and medulla; but under certain conditions may show the effect of the higher centers.



The outer layers of the cortex of the brain are thought to be the origin of thinking, and their functioning is interpreted as mind, as these functions regulate and control the actions of the individual as a whole. These functions learn how to react, and so are known as conditioned responses, but in order that these responses may be learned, the cerebral cortex must necessarily be brought into relation with the environment through the sense organ. If the person is to become an intelligent individual these responses must be coördinated, and the resulting conduct is the sign of personality.

In order that this conduct may be normal, the brain and the general nervous system of the individual must be healthy; otherwise, the adjustment of the individual to his environment cannot take place efficiently. If the individual is to adjust properly, it is necessary that he can profit from his experiences in the environment. The results of these experiences must be organized, associated and brought into relation with previous experiences, and the person must learn to transform these experiences into appropriate actions. As in physical processes, mental processes having once occurred, tend to recur in the same way when the same conditions are repeated.

Although it is important to take these fundamental facts into account, if an attempt to prevent or curb the incidence of nervous and mental disorder is to be considered, several other factors of prime importance must be noted. These are sound heredity, careful protection of the health of the mother during pregnancy, all possible care and skill at the time of delivery of the child, careful and sensible guidance through the first years of life, rational school training, proper supervision during the adolescent years, abstinence from drugs, sexual and alcoholic excesses, avoidance of syphilitic infection and other organic diseases which affect the nervous system, and, of course, prevention of conflict in general, anywhere in the environment.

Just as the principles of eugenics must be taken into account in the improvement of physical health, so necessarily this must be thought of when considering the possibilities of the inheritance of nervous or mental disorders. Where there is a possibility of hereditary taint, there should be no intermarriage, or certainly no children should be brought into the world from such progenitors. In most states, birth control advice cannot be given legally to this type of case, and in Connecticut it is even illegal to practice contraception. Realizing that there are types of mental disease and mental deficiency which have an hereditary tendency, a number of states, including Connecticut, have a law permitting sterilization under certain circumstances. While sterilization is of undoubted value in the prevention

of poor mental stock, the procedure can be logically recommended in only a very restricted group.

The health and environment of every prospective mother is a matter of vital importance to the mental hygienist. There has already been sufficient research work done to prove conclusively that the environment of the mother during the time that she is carrying the child definitely affects the child in utero. This may be shown by the sudden start that the unborn child gives when a sharp noise is made near the pregnant woman. If this is often repeated, the child of course does not get the necessary rest. Incidents in the emotional life of the mother, such as persistent worry, neglect, or other great emotional disturbances, and physical states, such as malnutrition, glandular dysfunction and renal disease, are found frequently in the prenatal history of children suffering from arrested development and cerebrospinal disorders. It is well to urge upon the prospective mother and her relatives that her whole physical and mental condition while she is carrying the child may have great effect upon the development of her baby.

Some children are born mentally defective, but this does not necessarily mean mentally diseased, although every case is a mental hygiene problem. Feeble-mindedness is a state of retarded mental development due to a number of causes, including heredity, injury at birth, and certain diseases. Feeble-mindedness, unless due to some physical condition, is not curable while, on the other extreme, under proper treatment glandular types show almost miraculous improvement. It must be remembered that certain individuals are judged to be feeble-minded because of defects of hearing, vision, etc., which give them the appearance of being slow and backward, while all that is necessary is to correct the physical defect in order to alleviate the erroneous impression.

Feeble-minded persons become social problems for the same reasons as other people. Barring bad environment and the lowest stages of feeble-mindedness, such as idiocy and imbecility, a feeble-minded person who is not afflicted with mental unbalance or some psychopathic condition has a fair chance, with the proper kind of training, to get along reasonably well in the community. Even the low grade defectives can be taught certain very simple occupations, much to their own benefit, with the result that it is easier to manage them in institutions. It is also possible to make them, to some extent, self-supporting in this way.

The importance of proper physical care of the child in the first months of life is recognized by all public health workers, but in no

less a degree is it important to follow with sensible training and discipline in the early years. It is recognized that the early environment makes a very definite imprint on the development, and it may be stated, without dispute, that many of the neuroses and psychoses of later life could be prevented if the child in its early years were guided sensibly with due regard to its emotional development.

It matters not whether the hereditary background be a simple neurasthenic, hysteric, or manic depressive personality, the family environment plays a very important rôle. There is a generally accepted opinion that heredity has a very big part in determining many of the mental diseases, but this belief is much too pessimistic to be accepted, for these predispositions many times can be counteracted, if not nullified by healthy environment. Every child at birth should be considered potentially normal, although it is important to watch with greatest care during the early, formative years, as he may show a tendency toward one of the neuroses or psychoses.

Children are normally imitative, and should they happen to be born to parents of the hysterical type, they are likely to imitate their performances, and become hysterical themselves. There is little use in instituting any form of treatment unless the hysterical child can be put under the charge, continued over a number of months or years, of an intelligent nurse, teacher or foster-parents, who will study its peculiarities and make a serious attempt to influence its behavior along natural, healthy lines.

In recent years special stress has been laid upon the earliest possible recognition of mental abnormality, as early diagnosis usually leads to the necessary steps to prevent mental disease later in life. This is the basic thought underlying the mental hygiene movement. It is the reason for the establishment of child guidance clinics, for careful personality studies, and for much of the social and psychological work that is now being attempted in the family, school, and industry. In all this work the assistance of the general medical man and the public health worker is needed, for they have in mind the physical well-being, and should also have the mental and moral development of the individual. They should know not only the child and the youth, but also the parents and their ancestry and should be willing to avail themselves of such facts as the social worker, psychologist or psychiatrist may provide. They should also be able to keep an open mind toward the many prevalent fads, but they should not be swept under by public enthusiasm.

From the physical side, as mentioned above, conditions may be present in the mother that will definitely affect the personality of

the child. Damaging toxic substances may be introduced through the walls of the placenta and a minute injury in the placenta may even allow the passing of a vast number of microorganisms into the child. If syphilis is found in the pregnant woman, she should be given intensive treatment; otherwise the child is likely to be a victim of neurosyphilis. It has been shown that tuberculosis, poliomyelitis, encephalitis and some of the other infectious diseases, or their toxins, may be transmitted to the child, causing definite damage to the nervous system, even before birth. It is, therefore, necessary to protect the mother carefully if the child is to be mentally healthy.

During labor, naturally the mother should receive first consideration, but unfortunately the physician or nurse does not always take sufficient cognizance of the actual injury that may be inflicted upon the child. Often its entire life is affected by improper obstetrical methods at the time of delivery, such as prolonged compression of the skull, protracted dry labor and unskilled instrumental delivery, which are responsible for many infantile cerebral lesions, especially the monoplegias and hemiplegias which may subsequently develop into epilepsy and which might well be prevented. If the public health worker is reminded of the fact that occurrences immediately before and during delivery not only may result in various forms of paralysis but may lead to something that is far worse, such as chronic epilepsy and idiocy, he or she will realize the obligations toward the child that is being helped into the world. These conditions resulting from the so-called birth accidents certainly are avoidable.

In recent years public health workers have become more and more aware of the fact that many of the diseases of childhood are apt to have neural sequelae. Most common of these are acute anterior poliomyelitis—occurring most frequently in children, but often in adults—epidemic cerebrospinal meningitis, and epidemic encephalitis, otherwise known as encephalitis lethargica. Since many of these diseases are extremely infectious, it is necessary to isolate the patients not only to prevent the spread of the disease, but also the almost inevitable mental conditions that follow.

Today mental hygienists are faced with a very grave problem in the number of post-encephalitis cases that are coming to their attention. But it has been found that the post-encephalitis syndrome need not necessarily be preceded by encephalitis lethargica, as some of the other high fever diseases, such as scarlet fever, often cause much the same "moral" deterioration. It should be emphasized here that the care of the patient suffering from any of these infectious diseases of the central nervous system plays an important part in the prevention

or restriction of the sequelae which are far more disastrous than the actual infection. In all these cases it is important to prolong the period the patient is in bed until every vestige of the inflammatory process has disappeared, and this should be followed by a very long-controlled, convalescent period with proper occupational therapy.

Syphilis as a precursor of nervous and mental disease is of paramount importance when it is realized that up to 73 per cent of all syphilitics develop neurosyphilis. Everyone with primary syphilitic disease should be considered potentially neurosyphilitic, and lumbar punctures for diagnostic purposes should be the routine rather than the exception. The prevention of neurosyphilis or general paresis, of course, means the persistent and thorough treatment of the primary disease. Because the malaria treatment of general paresis has shown such gratifying results, is no reason for delay in carrying out thorough treatment before any neurological signs develop.

There are a number of distinctive hereditary conditions; among these being Friedrich's disease, hereditary spastic paralysis, progressive muscular dystrophy, and amaurotic family idiocy. If anything can be done to prevent the development of these disorders it is only by ruling against marriage of individuals coming from families in which one of them has been prevalent. This of course necessitates a very careful family study and if the parties involved desire to marry they should be sterilized, as inevitably the disease will appear in their progeny. Some of them appear to be accompanied by endocrine disturbances and there is some question at present if immediate endocrino-therapy in new-born children from such families might not prevent the development of the disease later in life. When the presence of one of these diseases is established it is necessary to use every effort to counteract disturbances in normal locomotion and the general use of the limbs, which inevitably follow.

There are a number of functional disorders known as chorea and tics which apparently start on a definite physical basis, but become habits. It is therefore necessary to stop these conditions before they become established. At least one-fourth of these complaints seen in adults might have been prevented if they had been given thorough treatment in childhood. All sources of irritation should be removed, such as ill-fitting spectacles, irritating scars on the face or other parts of the body, ill-fitting collars and clothes, hair poorly cut and hanging over the eyes. Patience in training the patient to overcome these habits is a necessity.

So-called fainting spells and lapses of consciousness may be the first manifestation of the epilepsies, as may also be the convulsions of

early childhood. In no other type of disease is a complete physical examination of greater importance, for although the condition may be of emotional origin, it may be organic, and thus be starting a faulty habit pattern.

Disorders of the internal secretions play an important part among the preventable mental diseases. Of late years the physiological functions of the thyroid gland, the pituitary, the adrenal, the pancreas, and the sex gland have been studied so successfully that the use of these glands or extracts of them has distinct therapeutic and prophylactic value. Myxedema, cretinism or idiocy, hypo-pituitarism, various forms of distorted growth and various sexual abnormalities have been held in check or arrested in their extreme development by feeding the individual with one or the other of these glandular products. It is therefore very necessary to determine if there is an endocrinopathy present in the individual.

There are a number of emotional conditions which call for special attention. The obsessions of early childhood are most often based upon some experience, bad or otherwise, that the child has had, and which continues to hound him. Then there are so many individuals of abnormal habits seen in everyday life that the importance of checking such tendencies in early childhood cannot be stressed too strongly. Many physicians and public health workers do not seem to realize the effects of these emotions, for when a patient comes to them stating that he is afflicted with some physical impairment, and who in reality is suffering keenly, they often dismiss him with the statement that there is nothing the matter with him. This explains to no small extent the widespread use of cultists, such as chiropractors and others to whom these discouraged people so often go as a last resort, and getting attention, get relief.

Boys and girls of school age, and especially beginning with adolescence, are prone to mild mental disorders. Many of them are just nervous, some are hypochondriacal, and a considerable number are afflicted with a sense of inferiority, although this is by no means as common as the discussions on the "inferiority complex" would lead one to believe. In all such cases, it is a matter of the utmost importance that the home and the school environment be examined carefully and that the child in his relations to his family and to the other pupils at school be carefully determined. Personality studies will be most helpful providing the person conducting them shows a proper sense of proportion and does not exaggerate any complaints that are relatively unimportant. It is well to remember that every individual is expected to conform to conventional standards of behavior, and if he

cannot be made to do so it would be well to inquire into the reason why he is different from the average. In many cases, conditions have to be altered to meet the needs of a particular child, but it is well not to be too indulgent, and not to make too much ado over slight peculiarities in the behavior for this is likely to encourage the development of neurosis.

In children and in adults, speech disorders, headaches and insomnia are among the preventable complaints.

Among young adults, dementia praecox and manic depressive psychoses are the two conditions which cause more mental illness than any others, and it appears that although heredity may be a factor in these two conditions, environment or destructive experiences are the precipitating causes. In the adolescent period when usually the first great struggle for existence becomes manifest and the question of economic support first presents itself individuals are apt to subject themselves to unusual efforts. It is necessary that they realize that there are margins of safety and that a limit to endurance exists. Not every boy or girl is mentally fit to stand the strain of a college education. Certainly not all those who attempt to enter one or another professional career are fitted for such. If individuals are more carefully directed into the lines of work for which they are mentally and physically fitted, many of them will be prevented from later mental catastrophe.

The problem of the feeble-minded, the epileptic, neurotic or psychotic is but one phase of mental hygiene, as it is something which affects all persons. Nothing is more important than the right mental attitude toward life's problems in general. No one can grow up from childhood and live a life of ordinary length without conflicts, doubts, and problems which tend to make adjustment to life difficult. Some cope with these problems with reasonable success; others simply cannot find a level, and may develop any one of a number of mental abnormalities or kinks and twists which interfere with their happiness and efficiency, and even more with the happiness of those with whom they come in contact. Unfortunately, few have a working knowledge of the rules of mental health. They do not even know that there is a group of specialists in the medical profession equipped by experience and training to help those afflicted with these abnormal mental states. One of the important items in any public health program is to get over by every educational means possible, better knowledge of mental health, the importance of preventing bad mental habits in children, and knowledge of the facilities for handling such problems in the community.

Mental hygiene has also a definite relation to the problem of crime,

but it is possible here only to make reference to it. There are many persons being placed in jail, and others being convicted of crime and sent to state penitentiaries, who are mental cases, but not always recognized as such. Some of the more enlightened states make careful study of the inmates of the state penal institutions, in order to determine their mental condition, and, where necessary, are placing the mental cases in proper institutions. While psychiatry is certainly not the entire key to criminality, it does play an important and distinct part. Although this fact is not as yet fully accepted, it is hoped that the time is not far distant when it will no longer be customary to pit one "mental expert" against another in the court room. Fortunately, some states have a definite committee of psychiatrists to examine offenders when a question of mental disease is raised, and which can scientifically recommend the disposition of these cases.

Among the most ancient problems confronting the human race are those connected with home, marriage and domestic relations. At present our ideas on these subjects are undergoing a rapid transition in America and throughout the world. Ancient views and fixed traditions are giving way before clear thinking. There is a confused difference of opinion as to what should be discarded and what retained. Whatever may be the viewpoint on the subject of marriage and divorce, it is generally accepted that there are far too many divorces for the general good of society. A careful study of statistics during the last forty years shows that legal separation is on the rapid increase. In 1887, there were but 5.5 divorces to every 100 marriages, by 1919, this number had increased to 10, and since 1919, to more than 15.

It is not surprising that welfare agencies of every type are looking about for assistance in studying this trend toward wholesale divorce. They have come to the mental hygienist to inquire what, if anything, can be done to better the situation by means of mental hygiene. Experience has shown that mental hygiene is not a panacea for this situation, as it is not for most of the other mental maladjustments. In fact the presence of the "mental expert" in the criminal courts has occasionally hindered rather than aided the cause of justice, but, it must be added, this often is due to untrained "experts." There is a great dearth of trained and experienced persons, who are competent to handle the delicate temperament of the would-be divorcee. The harm that inexperienced hands may cause in attempting to cure a mental situation is very great, and may even cause greater difficulty by such mishandling. Over-zealous enthusiasts often attempt to do what lies beyond them.

Recently there has been some enlightening research work done on



the subject of family relations. It was found that the causes for divorce were in the approximate order of importance as follows: temperamental incompatibility, physical dissatisfaction, restraint of personal freedom, ill-health, jealousy, differences over children, economic difficulties, relatives and "everything wrong." All will agree that most of these causes are purely mental maladjustments. If to these items are added undue pride, abject poverty, mental defect, unstable temperament, chronic illness or a combination of these, one can realize some of the mental stresses that impel people to divorce, and it is only by the diminution of these persistent annoyances that anything can be done to prevent or lessen it. This may need the care of a mental specialist, for the successful mental clinician is able to secure the subject's coöperation and the full and confidential statement of the patient's grievance as no one else can. The mere fact that he has given voice to all his pet worries is often sufficient to set him on the road to a new adjustment, for it is often the pent-up, petty annoyances that gradually lead to a wider and wider rift, which eventually ends in the divorce court.

When unmarried youth has been taught the facts of mental hygiene which concern marriage and living together happily, there will be less fear when marriage actually occurs. Somewhere these people must get an understanding of the necessary "give and take" of married life, must reach some conclusion as to the degree of temperamental difference they can permit; must gain some sane and sound views on sex and its relation to a happy marriage; must appreciate the differences of opinion that are likely to arise over economic difficulties, children, relatives, and social and religious affairs. This is one of the problems which mental hygiene is now working on, and which should be given the concern of every public health worker.

It is evident that in any mental hygiene program it is very necessary to study the individual as a whole, socially, physically, intellectually and emotionally. This necessitates a thoroughly trained psychiatric social worker who can study the environment. This may be a trained nurse who has had experience along this line, who can go into the home or school environment and study the conditions under which the individual lives in order to help the diagnosis of the case, or to find what may have to be changed in order to help the person readjust himself to society. The physician has to make a very careful physical examination in order to determine that there is no physical abnormality or inferiority present. Then the psychologist is necessary to determine the inherent intellectual ability of the individual to make such an adjustment, and the psychiatrist, taking the facts as

found by the others, and studying the individual from the emotional angle, tries to digest all the material obtained in order to determine whether it is the heredity, the environment or the individual that needs readjustment. Thus, only, can mental hygiene hope to succeed, and thus it is apparent that no public health program is complete without a very careful mental hygiene program.

## Mental Development of Feeble-minded Children

DURING a 9-year period, 86 children passed through a special school for defectives in Bath, and were discharged as follows: 27 per cent were passed to the statutory mental deficiency committee as imbeciles, that is to say, they proved unable to fend for themselves in life; 36 per cent were classified as low grade feeble-minded, probably unable to fend for themselves; and 37 per cent were considered able to fend for themselves.

The actual results up to the end of 1925 are known as regards 52 children, of whom 42 per cent are at work fending for themselves, 10 per cent are out of work, apparently failing to fend for themselves, 25 per cent are at home incapable of work, and 23 per cent are in institutions. The fact that 42 per cent of the children trained in this particular special school were able to find work, and that only 23 per cent had to be placed in institutions, is at least encouraging; but, even so, there can be little doubt that the colony system on a large scale is the optimal method of dealing with certifiable mental defect in the bulk.—Abstracted from *Brit. M. J.*, London, June 14, 1930.

## The Prevalence of Syphilis

THE Massachusetts Department of Health, coöperating with the U. S. Public Health Service, has just published a bulletin dealing with the ravages caused by syphilis and gonorrhea. When one bears in mind that these diseases are very incompletely reported it will come as a shock to many that during the 8 years embraced in this study (1920-1927 inclusive) the *reported* number of cases of syphilis was very much greater than the reported number of cases of scarlet fever, diphtheria, smallpox, typhoid fever and tuberculosis. The actual figures given in the bulletin are as follows:

35,083	more cases of syphilis than of scarlet fever	(42 states) *
1,017,465	more cases of syphilis than of diphtheria	(42 states) *
390,268	more cases of syphilis than of smallpox	(41 states) *
1,122,580	more cases of syphilis than of typhoid fever	(41 states) *
78,570	more cases of syphilis than of tuberculosis	(21 states) *

\* Only those states reporting both diseases were included.

—*Weekly Bull.*, Dept. of Health, New York, N. Y., July 5, 1930.